

**Building Employee Resilience through Wellbeing in
Organisations**

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Abstract

Organisations and employees are required to display resilience in today's constantly changing and unpredictable business environments. Whilst research into how individual-level resilience contributes to an organisation's adaptive capacity is emerging, there is a gap in the literature on how trait, employee and organisational resilience interact, and how they may be influenced. This study investigated the inter-relationships between these resilience constructs, and whether a wellbeing intervention would influence these resilience levels and employee attitudes and wellbeing. Participants ($n = 216$), from two organisations, completed an online survey on 'employee wellbeing'; with 145 of those participants then taking part in a workplace wellbeing intervention, followed by a second survey. Results supported positive relationships between trait, employee and organisational level resilience, providing support for the argument that a resilient organisation consists of resilient employees. The results also highlighted the unique contribution employee resilience makes to employee attitudes and wellbeing. Following the wellbeing intervention, small increases were noted in employee resilience and wellbeing, indicating the developable nature of these constructs. However, the intervention was not influential on trait or organisational-level resilience. Findings of the study are discussed in terms of their theoretical and practical implications, and recommendations are made for future research into supporting employee and organisational resilience.

Introduction

Sustainability is a very real consideration for today's organisations which, now more than ever, must respond to issues of resource scarcity, external pressures from suppliers, technological advances, changes in government policy, and emerging ethical issues of production or supply (Dunphy, Benn, & Griffiths, 2014). Added to this, national crises such as the Canterbury earthquakes, and those on a worldwide scale such as the global financial crisis (GFC), highlight the often unpredictable and changing environment which organisations are working in. Succeeding in these unstable and unpredictable conditions is contingent on an organisation's resilience and ability to constantly adapt (Lee, Vargo, & Seville, 2013). Whilst the ability to adapt is pertinent to organisational survival, research suggests less than one third of organisational change initiatives are rated by executives of these organisations as successful (Keller, Meaney, & Pung, 2010).

When considering factors in the success of any organisation, it is vital to remember that an organisation is made up of people, and it is these employees whose productiveness the organisation relies on for its success and ultimate survival (Schaufeli, Ouwenel, & Le Blanc, 2013). Employees play a central role in the success of any organisational responses to their environment through their attitudes and behaviours, including openness or resistance to change (Griffith & West, 2013) and performance when required to constantly adapt (Neubert & Cady, 2001).

Currently, research on developing a workforce that contributes to the organisation's resilience tends to take an operational focus. For example, it is suggested that the actions and interactions among individual organisational members underpin the emergence of a firm's collective capacity for resilience (Morgeson & Hofmann, 1999). In this vein it is argued that strategic human resource management systems are instrumental in invoking the appropriate collective routines and processes to generate resilience outcomes.

As the science of organisational psychology has advanced over time, contemporary resilience researchers have turned their attention to individual characteristics of employees which may be associated with an organisation's resilience (Avey, Luthans, Smith, & Palmer, 2010; Lengnick-Hall, Lengnick-Hall, & Beck, 2011; Wanberg & Banas, 2000), specifically resilience at an individual level (trait resilience). Contemporary research indicates that resilience in individuals results in outcomes such as lower levels of psychological distress (Min et al., 2013), higher levels of optimistic thinking (Cooper, Flint-Taylor, & Pearn, 2013), and more positive work attitudes (Youssef & Luthans, 2007). Resilient employees recover better and more quickly from disruptions than non-resilient employees and are more adaptive and responsive to organisational changes necessary for organisational success (Shin, Taylor, & Seo, 2012). Interestingly, this adaptation is not contingent on the employee viewing the workplace changes positively; instead it is argued that individual level resilience increases the employee's tendency to accommodate changes even if they do not necessarily want the change (Wanberg & Banas, 2000).

Building on these views, an emerging concept in the research on organisational resilience is 'employee resilience', a construct argued to be distinct from inherent trait resilience in that employee resilience is a variable that is specifically facilitated by organisations through the creation of 'organisational enablers'. Empirical data now exists to support the argument that employee resilience contributes to key performance drivers, including positive employee attitudes and behaviour (Näswall, Kuntz, & Malinen, 2015). What has yet to be tested, and thus will be investigated in this study, is the relationship between trait and employee resilience.

Various untested assumptions continue to be made in the resilience literature. For instance; there is a widely held assumption that resilient organisations consist of resilient employees (Lengnick-Hall et al., 2011). However, gaps in the literature exist on how

organisational resilience and employee-level resilience interact, and how individual differences contribute to employee resilience. Furthermore, what is also unknown is how stable trait resilience, employee resilience and organisational resilience are. Researchers are now increasingly claiming employee resilience can be developed through organisation interventions (Bardoel, Pettit, De Cieri, & McMillan, 2014; Luthans, Avey, Avolio, & Peterson, 2010). However, a pertinent question which will be investigated in the present study is ‘what is a *practical* way that leaders of an organisation can increase the resilience of its employees?’

A small number of contemporary organisational researchers have begun focusing on employee wellbeing, deemed to be an outcome of resilience which leads to enhanced employee productivity (Page & Vella-Brodrick, 2013; Pipe et al., 2012) and, controversially, improved organisational outcomes (Luthans et al., 2010). Whilst improving financial results through wellbeing interventions may be the ultimate goal of some organisations, there is scant empirical evidence in the literature to back up claims of employee wellbeing improving organisational finances (Meyers, Woerkom, & Bakker, 2013), partly due to the constantly changing environment of organisations often being incompatible with the restraints of traditional research method requirements for claiming cause (Cameron, Mora, Leutscher, & Calarco, 2011). Furthermore, whilst investing in employee wellbeing initiatives may appeal as a modern approach to building organisational resilience, research in this area is in its infancy (Meyers et al., 2013; Robertson, Cooper, Sarkar, & Curran, 2015). Researchers and organisations need to understand if promoting wellbeing at work has a direct influence on employee resilience and organisational resilience.

There are two primary objectives of this research. First, this research will empirically investigate previously untested assumptions of how resilience at individual (trait resilience), employee and organisational levels interact. Second, it will investigate whether supporting

the wellbeing of employees at work may act as an ‘organisational enabler’ of employee-level resilience and, even if it can, whether it adds any value to the organisation’s overall resilience. In addition, the research will investigate any potential benefits to work-related attitudes that may arise through supporting wellbeing at work. This knowledge may guide organisations in how they best invest in employee psychological resources for the benefit of both the individual and the organisation.

Organisational Resilience

Organisational resilience can be defined as “a function of an organisation’s overall situation awareness, management of keystone vulnerabilities, and adaptive capacity in a complex, dynamic, and interconnected environment” (McManus, Seville, Vargo, & Brunsdon, 2008, p. 82). Organisational resilience plays a central role in not only organisational survival, but also in the survival and functioning of the wider community in the face of adversity, by virtue of communities’ dependence on organisational services (Lee et al., 2013). Not only can organisational resilience enable an organisation to respond to various disturbances and threats, anticipate disruptions and learn from experience (Hollnagel, Nemeth, & Dekker, 2008), it is argued that organisational resilience is a contributor of an organisation’s competitive advantage (Parsons, 2010). Taking a top-down approach, it is suggested that leaders of resilient organisations empower employees to use their skills to solve problems and create a culture whereby employees understand the link between their own work and the organisation’s resilience (Lee et al., 2013).

More than simply understanding the role that employees play in their organisation’s survival, empirical evidence also indicates a key indicator of organisational resilience is work engagement (Lee et al., 2013), which in turn is driven by employee resilience (Näswall et al., 2015). Indeed, at an individual level, employees with high psychological resilience have a tendency to be highly supportive of organisational change due to the positive emotions they

experience during such change (Shin et al., 2012). Thus, it would make sense that when considering organisational resilience that focus must also be given to the wellbeing and resilience of employees who work for the organisation. Advancing on this theme, contemporary researchers now argue that organisations need to move away from reactivity to the emotional upheaval caused by continuous change, and move towards a deliberate investment in the *development* of resilience in all the people who work there (Luthans, Vogelgesang, & Lester, 2006). This raises some important questions. For example, ‘exactly what difference does resilience in employees make to an organisation?’ and ‘can an organisation develop employee resilience?’ In order to answer these questions, it is necessary to form a definition of ‘individual resilience’.

Defining Trait Resilience

The term ‘resilience’ has its origins in the disciplines of science and mathematics, with an often quoted example of resilience being the process of a metal bending under stress, and then ‘bouncing back’ without breaking (Lazarus, 1993). Use of the term ‘resilience’ to describe contributors of human survival also has a long history in the behavioural sciences (Garmezy & Masten, 1986; Lazarus & Folkman, 1984; Masten & Obradovic, 2006).

Consensus has thus far not been reached on how to best operationalise resilience (Windle, 2011), with each definition being influenced by the historical and socio-cultural context, along with the sample population, of which the research was conducted (Fletcher & Sarkar, 2013). Over time, behavioural researchers have held varied and often contrasting views; resilience is a fixed trait (Block & Block, 1980; Connor & Davidson, 2003), a state and developable resource (Luthans et al., 2006), can only be ‘triggered’ by adversity (Bonanno, Rennie, & Dekel, 2005; Luthar & Cicchetti, 2000) through internal (Kelley, 2005) or external sources (Bonanno et al., 2005), can be fostered in stable situations (Näswall et al., 2015), enables individuals to recover from setbacks (Windle, 2011) or, not only thrive, but

experience adversarial growth (Linley & Joseph, 2005; Luthar & Cicchetti, 2000; Masten & Obradovic, 2006).

The study of individual resilience can be traced back to 1970s clinical and developmental psychology research which focused on personal qualities of ‘resilient children’ that enabled overcoming of extreme adversities such as disasters, poverty, neglect and parental psychopathology (Anthony, 1974; Garmezy & Masten, 1986). In this context, resilience was characterised as a trait (Anthony, 1974), a stable individual ability of these remarkable children to ‘bounce back’ from adversity and flexibly adapt to changing demands (Block & Block, 1980; Block & Kremen, 1996; Lazarus, 1993). Moving the focus to resilience in adult populations, the term ‘resilient personality’ (Major, Richards, Cooper, Cozzarelli, & Zubek, 1998) was created to represent individuals who were assisted in coping and adjusting in stressful situations by high levels of self-esteem, optimism, and perceived control (Lazarus, 1993; Masten & Obradovic, 2006; Taylor & Brown, 1988; Wanberg & Banas, 2000).

In the 21st century, a growing body of research challenged the stance that resilience is fixed, to posit that resilience is an outcome of the processes (including gene and environment interaction) which underlie effective responses to environmental hazards (Rutter, 2006). Proponents of the ‘ecological’ perspective of resilience argue that first and foremost social and physical environments of the individual should be considered when trying to understand the protective processes that contribute to functional outcomes associated with resilience in the face of adversity (Schoon, 2006; Ungar, 2012). The authors of two extensive literature reviews of over 270 resilience research articles share a common view of resilience: ‘resilience is a combination of assets and resources *within* the individual and their *environment* that facilitate the individual’s capacity to adapt in the face of adversity’

(Fletcher & Sarkar, 2013; Windle, 2011). This definition acknowledges both trait and process contributions to resilience.

Developing Resilience

Clearly, arguments for whether resilience can be developed or not rest on the conceptualisation of resilience. There is some clinical evidence to suggest individual level resilience is modifiable and can improve with pharmacological treatment (Connor & Davidson, 2003). For the purposes of investigating the second research question regarding whether work-related resilience can be developed or not, the resilience literature has best been summarised by Connor and Davidson (2003) who state that “it is possible to perform well in one area in the face of adversity (e.g., work) but to function poorly in another (i.e., interpersonal relationships), (p. 81)”. Individual resilience falls on a continuum of differing degrees across multiple domains of life (Gillespie, Chaboyer, & Wallis, 2007; Pietrzak & Southwick, 2011). This perspective was highlighted in an introduction statement in a paper inspired by a 2013 panel of multidisciplinary experts on resilience who, although unable to reach consensus on an exact definition of resilience or its antecedents, emphasise the context-dependency of resilience (Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). In line with trait activation theory (Tett & Guterman, 2000), in which the situation determines the extent of expression of a trait, resilience may be triggered by the presence of support in a specific context.

Employee Resilience

In order to focus the empirical enquiry of individual resilience in organisational settings to the context of ‘work-specific’ resilient behaviours, the concept ‘employee resilience’ has been proposed (Näswall et al., 2015). In line with the ecological perspective on resilience, employee resilience can be defined as “employee capability, facilitated and

supported by the organisation, to utilise resources to continually adapt and flourish at work, even if/when faced with challenging circumstances” (Näswall et al., 2015, p. 1). A key assertion of this definition is that employee resilience is something that can be facilitated by support from the organisation in the form of ‘organisational enablers’. It is argued that employee resilience contributes to key performance drivers, including positive employee attitudes and behaviours (Näswall et al., 2015). Additionally, employee resilience may be seen as a protective factor on employees’ reactions to change in the work place (Shin et al., 2012). In the context of wellbeing at work, research indicates that resilient employees are more responsive to necessary organisational changes and possess a greater capacity for recovery from workplace disruptions than non-resilient employees (Shin et al., 2012).

The employee resilience construct is distinct from other, seemingly analogous constructs in three ways. Firstly, unlike trait resilience, employee resilience is operationalised in terms of workplace behaviours, rather than attitudes or beliefs. Secondly, the extent to which the organisation provides work-related resources influences the enactment of resilient workplace behaviours, rather than just psychological perspectives toward work. Thirdly, resilient behaviours can be developed and enacted in any work environment, even in the absence of a crisis trigger (Näswall et al., 2015). Overall, the definition of employee resilience reflects a behavioural construct which is different from, but related to, existing constructs that describe the capacity to thrive following, or despite of, challenges. By emphasising the aspect of ‘growing’ from experience, this definition for employee resilience is in contrast to other contemporary views of individual resilience in which resilience is argued to reflect the ability to *maintain*, or quickly return to, a stable equilibrium (Bonanno, 2004) following adversity (Fletcher & Sarkar, 2013).

It is argued that employee resilience can and should be built by organisations, not exclusively in reaction to some trigger, but also in response both to incremental changes that

routinely occur, and in stable work environments (Lee et al., 2013; Lengnick-Hall et al., 2011). Thus far, resilient employee behaviours have been found to be influenced by the employee's organisation by the use of three 'organisational enablers': leadership (supportive supervision), learning culture, and a supportive work environment (supportive team and organisation) (Näswall et al., 2015). In times of organisational change or transition, a leadership style which provides employees with regular feedback on their performance and not only expresses concern, but provides support to employees to assist them in managing changes in their work environment, is believed to increase employees' capacity to adapt and their motivation to support organisational change. Secondly, an organisation which has a 'learning culture' (Näswall et al., 2015), whereby the organisation encourages sharing of information across work groups, creative thinking, and a 'trial and error' approach to new situations or challenges, is linked to improved employee change adaptability (Marsick & Watkins, 2003). Thirdly, organisations can influence employee resilience by fostering a supportive work environment which includes positive social support. When employees can openly share errors, setbacks and both negative and positive views with their team mates and managers, employees are more likely to learn from experiences, thus strengthening employees' capacity to effectively respond to challenges (Näswall et al., 2015).

In summary, all employees possess trait resilience to a varying degree (Southwick et al., 2014). Additional to this, organisations can provide work-specific enablers which facilitate work-specific resilience (employee resilience) (Näswall et al., 2015), which in turn is assumed to be a key contributor of organisational resilience (Näswall et al., 2015). Thus, it is reasonable to hypothesise that trait resilience is the foundation on which employee resilience is built from, and beyond. In other words, employee resilience contributes to organisational resilience beyond individual trait resilience (Näswall et al., 2015). This

research will investigate employee resilience and, as a test for its construct validity, control for trait resilience.

Hypothesis 1: There will be positive relationships between trait and employee resilience, employee and organisational resilience, and trait and organisational resilience.

Hypothesis 2: The relationship between employee and organisational resilience will be stronger than the relationship between trait and organisational resilience.

The Relationship of Workplace Wellbeing and Resilience

Recently, a somewhat provocative suggestion has been put forward that employees should be selected on the basis of existing individual resilience (Britt, Shen, Sinclair, Grossman, & Klieger, 2016; Shin et al., 2012). This perspective has been derived from research which found that leadership behaviours had an impact on employees' capacity to positively frame the workplace and capitalise on existing resources during change (Shin et al., 2012). However, the impact of leadership behaviours was considerably less for trait resilience (Shin et al., 2012). Thus, as it may be difficult (although not impossible) to develop trait resilience, the argument follows that it may be less effort for organisations to simply hire people who have high levels of trait resilience in the first place. In turn, for building resilience in existing employees, Shin et al. (2012) highlight the applicability of conservation of resources theory (Hobfoll, 2001), which argues that, in response to demanding and stressful environments, individuals seek psychological or material resources which protect them from the effects of such stressors. As such, Shin et al. (2012) advocate that organisations should provide interventions to build existing employees' individual resources prior to any change initiative in order to reduce the strains experienced during organisational change, and build commitment to changes. Given the evidence suggesting that employee resilience behaviours (e.g. effective collaboration on work challenges and learning from mistakes), can be facilitated through organisational practices (Malinen, Kuntz & Näswall,

2014), in order to understand how employee resilience and organisational resilience may be promoted through organisational interventions, further research is required to establish how stable such indicators of resilience really are.

Overall, research suggests that perceptions of a supportive team and perceived organisational support will be positively associated with employee resilience (Näswall et al., 2015). Specifically, support from the organisation is by far the most important contributor to employee resilience. This indicates that a supportive organisation is an essential enabling factor to the enactment of resilient employee behaviors. Indeed, building an organisational culture that supports the resilience of its employees may benefit both the employees' and the organisation's ability to adapt to the changing work environment. An example of the importance of organisational culture to adaptability has been demonstrated in research following the September 11th terrorist attacks in which 'resilient organisations' were those who drew on their culture and employee capabilities, rather than structures and technologies, to respond to emerging situations (Kendra & Wachtendorf, 2003).

A small number of resilience interventions in the workplace, both military (Griffith & West, 2013) and civilian contexts (Sood, Prasad, Schroeder, & Varkey, 2011) have shown promising significant effects on resilience at an individual level (with no significant differences in effect sizes found between these settings) (Vanhove, Herian, Perez, Harms, & Lester, 2015). However, the time commitment required by employees and their supervisors, along with financial costs for trained intervention facilitators, and high attrition rates, are strong deterrents for many organisations looking to invest in employee resilience (Abbott, Klein, Hamilton, & Rosenthal, 2009; Meyers et al., 2013). For example, results of a meta-analysis of 37 organisation sponsored resilience-building programmes (Vanhove et al., 2015) revealed that to achieve the greatest effect, programmes should target individuals with low levels of resilience and employ a one-on-one delivery format. A further consideration is that

there is no definitive evidence for the most effective training content or format for resilience training in the workplace (Robertson et al., 2015).

What Can an Organisation do to Increase Employee Resilience That is Cost Effective?

There are multiple pathways to achieving resilience in people (Southwick et al., 2014). Recent research suggests that, although trait-like characteristics of individuals may be the source of their psychological resources, it is the individuals' state positive affect which converts those resources to their change-related attitudes (Shin et al., 2012.). Positive thinking habits help to maintain a sense of wellbeing, defined as a combination of feeling good and functioning well (Aked, Marks, Cordon, & Thompson, 2008), and strengthen resilience (Cooper et al., 2013). The terms 'wellbeing' and 'resilience' are consistently associated with each other in the organisational psychology literature. Indeed, it is difficult to delineate these two variables. For example: sustainable wellbeing involves a characteristically positive style of thinking and responding and resilience (Fredrickson, Tugade, Waugh, & Larkin, 2003); resilience is characterised by positive emotions (Bonanno, 2004); favourable outcomes linked to an individual's resilience stem mostly from the individual's positive affect (Fredrickson et al., 2003); facilitating positive emotions can create personal resources (resilience) which in turn lead to increased positive emotions (Fredrickson et al., 2003). Thus, for the purposes of this study, the relationship between psychological wellbeing and resilience will be referred to as reciprocal.

Given the relationship between resilience and wellbeing, focusing on increasing employee wellbeing is an appropriate approach to building employee resilience (Cooper et al., 2013), and it is an important one due to Health and Safety legislation and well-documented rising stress levels in the workplace (Statistics New Zealand: Survey of Working Life, 2012). In New Zealand and many other OECD countries, there is a legal obligation to

provide psychologically and physically safe working conditions under Occupational Health and Safety laws (Health and Safety Reform Bill, 2015). Yet, in a recent workplace survey, 18.2% of employed people in New Zealand said they ‘often’ or ‘always’ felt stressed at work over a 12 month period (Statistics New Zealand: Survey of Working Life, 2012). As happy employees are healthier and perform better at work (Page & Vella-Brodrick, 2013), it stands to reason that having high levels of employee wellbeing is in the best interest of both employees and organisations (Harter, Schmidt, & Corey, 2003).

Therefore, the research questions considered in this study were “Would employees feel an increased sense of organisational support as a result of the organisation investing in employee wellbeing?” and, “Would a perception of support in this context then act as an ‘organisational enabler’ of employee resilience, which then leads to resilient employee behaviours?”

Building on these ideas which link organisation-sponsored employee wellbeing interventions with resilient employee behaviours, Shin et al. (2012) argued that, by directly influencing employees’ positive affect and social exchange, managers can increase employees’ commitment and behavioural reactions to organisational change (Shin et al., 2012). In this vein, managers are encouraged to invest in workplace interventions which not only induce positive emotions, but skill employees in monitoring and managing their positive emotions in the face of organisational change (Shin et al., 2012).

Positive Psychology Wellbeing Interventions

A positive psychology intervention is defined as a psychological intervention (training, exercise, or therapy) aimed at raising positive feelings, positive cognitions or positive behaviour, which leads to increased wellbeing (Sin & Lyubomirsky, 2009). Positive psychology interventions work to build employees’ individual resources prior to any organisational change. According to rational emotive theory (Ellis, 1999) an individual’s

cognitions are critical to appraising events as stressful or non-stressful. Individuals then act according to this appraisal. Subsequently, the way individuals appraise and give meaning to their experiences at work is a trigger to their psychological wellbeing (Lazarus & Folkman, 1984). In contrast to many studies in which organisational interventions involve changing the way work is designed and managed to improve employee wellbeing (Lengnick-Hall et al., 2011; Nielsen, 2013) the overall aim of positive psychology workplace interventions is individual *and* organisational flourishing (Cameron et al., 2011). As highlighted in social research on wellbeing, to make effective change, a small shift in wellbeing in all employees is more beneficial than a significant improvement in a few (Huppert, Baylis, & Keverne, 2005).

Research on wellbeing interventions in the workplace shows that positive psychology interventions are gaining traction from employers and employees alike as a more preferable alternative to re-designing jobs or costly reactive interventions (Meyers et al., 2013). These favourable attitudes towards positive psychology have been supported by a meta-analysis of 39 randomised controlled studies with both clinical and non-clinical participants (Haverman et al., 2013) which demonstrated that positive psychology interventions significantly enhance subjective and psychological wellbeing. Effect sizes ranged from small to very large (Cohen's $d > 2.0$), with the average effect size being small (Cohen's $d = 0.20$).

The more commonly cited positive psychology workplace interventions focus on employees experiencing gratitude, connectedness, and mindfulness. Numerous studies have linked gratitude, an orientation towards appreciating the positive in one's work life, to greater psychological wellbeing, both in clinical (Vasey & Harbaugh, 2014; Wood, Froh, & Geraghty, 2010) and work settings (Kaplan et al., 2014). The experience of feeling gratitude is believed to explain 20% of the variance in satisfaction with life (Wood, Maltby, Gillett, Linley, & Joseph, 2008) and has been found to be capable of being enhanced through

intentional practice (Adler & Fagley, 2005). Social interaction and co-worker relations (social connectedness) in the workplace have been found to be some of the strongest influences in employee psychological health (Chiaburu & Harrison, 2008; Myers, 2000). Social Connectedness interventions ask participants to actively engage in specific strategies to increase their social ties at work such as physically going to talk with a colleague, getting a coffee or going for a walk with a colleague (Kaplan et al., 2014). Mindfulness Based Stress Reduction (Kabat-Zinn, 2005) involves group meetings and individual activities including; walking meditation, mental scans of bodily sensations, and stretching. Activities are designed to raise awareness of breathing, physical sensation, thoughts, and intentional connection with the present moment. This form of mental training, through personal awareness and insight, is believed to lead to an increased ability to cope with potentially harmful mental processes. Drawing on these concepts, a new and importantly, practical, approach for a positive psychology workplace wellbeing intervention is The Wellbeing Game (the Game) (Mental Health Foundation, 2014).

The Wellbeing Game

The Game is a free online tool, developed and run by the Mental Health Foundation of New Zealand and based on *The Five Ways to Wellbeing* (Aked et al., 2008). In 2008 the New Economics Foundation, an independent think tank, was commissioned by the United Kingdom government to create a simple framework to promote mental wellbeing. Using a concept analogous to the United Kingdom's successful public health campaign 'Five Fruits and Vegetables a Day', the Five Ways to Wellbeing was designed to inform policy making and public messaging. The ability of the actions to promote wellbeing was backed by scientific evidence, the actions were meaningful across age and other population groups, and the group of actions provided variety and choice and could be self-directed (Aked et al., 2008). The five actions (Connect, Be Active, Keep Learning, Give and Take Notice) and their

contribution to wellbeing are summarised here forth. *Connect*: Social relationships provide a sense of belonging (Morrow, 2001) and are critical for promoting wellbeing and for acting as a buffer against mental ill health for everyone (Kirkwood, Bond, May, Keith, & Teh, 2008).

Be Active: Regular physical activity provides increased perceptions of self-efficacy and mastery, a perceived ability to cope, it detracts from negative thoughts and lowers rates of depression and anxiety across all age groups (Biddle, Fox, & Boutcher, 2000). Moreover, mood and affect have been shown to be improved by as little as single bouts of exercise of less than 10 minutes (Acevedo & Ekkekakis, 2006). The implication of these findings is that small changes in activity levels of desk-bound workers are likely to enhance wellbeing. *Keep Learning*: The continuation of learning through life has the benefits of enhancing an individual's self-esteem, encouraging social interaction and a more active life (Kirkwood et al., 2008). In particular, setting personally meaningful goals has been strongly associated with higher levels of wellbeing (Huppert, 2009).

Give: Mental wellbeing is enhanced when an individual is able to achieve a sense of purpose by contributing to their community (Aked et al., 2008). Thus, helping, sharing, giving and team-oriented behaviours are likely to be associated with an increased sense of self-worth and positive feelings. *Take Notice (akin to Mindfulness)*: When a person reflects on their experiences, it is argued that the individual will appreciate what matters most to them. Being in a state known as mindfulness (the state of being attentive to and aware of what is taking place in the present) has been shown to predict positive mental states, self-regulated behaviour and resilience (Aikens et al., 2014a; Goldhagen, Kingsolver, Stinnett, & Rosdahl, 2015; Keye & Pidgeon, 2013; Rogers, 2013). Self-determination theory suggests that an open awareness is particularly valuable for choosing behaviours that are consistent with one's needs, values and interests (Ryan & Deci, 2000). Thus, if players are encouraged to raise their awareness of things they can do which make them feel good; they are more likely to choose activities which meet their needs.

Lasting behavioural change can only be achieved if the proposed interventions are somewhat internalised and owned by the individual (Lyubomirsky, 2008). Increasing self-awareness by ‘taking notice’ may have the added benefit of enhancing this process.

Importantly, what differentiates the Game from other workplace wellbeing interventions is that participants can choose to partake in any or all of the Five Ways to Wellbeing actions. Multifaceted programmes which give participants a choice of activities (autonomy) are believed to increase motivation to participate (Sheldon & Lyubomirsky, 2006). The wellbeing activities are participant-led and embedded in everyday work (for example, having a walking meeting). By requiring players to record their wellbeing activities, the intention is that players will develop a better understanding of their own thoughts and actions which support their wellbeing (Aked et al., 2008). Further, drawing on the beneficial aspects of social connectedness, playing in a team is promoted as an opportunity to speed-up the ‘getting to know each other’ process and increase team cohesion (Mental Health Foundation of New Zealand, 2015). These suggestions of increased team cohesion as a function of playing the Game will also be investigated in this study.

The Game has been piloted with organisations across New Zealand by the Mental Health Foundation, and it has been found to have a moderate effect on wellbeing (*Cohen’s d* = 0.44) in a 2014 preliminary evaluation (Green, 2014). It takes less than one minute to record an activity, and the preliminary evaluation showed that recording an activity three or more days per week resulted in a significant increase in player psychological wellbeing. The Game is an appropriate choice of intervention to answer the second research question (“does focusing on employee wellbeing enhance employee resilience?”) as it facilitates two aspects previously identified as central to resilience; positivity and mindfulness, and encourages employees to monitor and manage their positive emotions (Shin et al., 2012). Importantly, when implemented in an organisation according to best-practice literature on gaining and

sustaining participation (Nielsen & Abildgaard, 2013), the low time and cost investment for organisations makes the Game a practical choice.

The present study draws on the theories of Southwick et al. (2014) (resilience is context dependent) and employee resilience (Näswall et al., 2015) when investigating the stability of trait, employee and organisation-level resilience. This raises the question of whether a workplace wellbeing intervention may trigger resilience in a work situation, whereby employees, enabled by their organisation, engage in work-specific resilient behaviours (e.g., ‘resolving crises competently at work’) (employee resilience), regardless of their functioning outside of work.

Because the organisation’s sponsorship of the Game here is framed in the specific context of an ‘organisational enabler’ (it is specifically phrased to participants as a workplace wellbeing intervention, and employees are encouraged to take part with their work colleagues within the work day) it was vital to investigate whether this simple organisational intervention could also be effective (as per the other more specific organisational enablers: leadership, supportive supervision and team) in increasing employee resilience. Given the ongoing debate on whether individual resilience is a trait (stable/fixed) or a state (open to change/developable), and the limited literature on the efficacy of workplace resilience interventions (Meyers et al., 2013; Vanhove et al., 2015), it is not known if trait resilience levels will change. However, the research on employee resilience gives some confidence to the argument that employee resilience is sufficiently distinct from trait resilience that it can be increased regardless of trait resilience levels.

Hypothesis 3: Taking part in a workplace wellbeing intervention, sponsored by the organisation, will increase levels of employee resilience and organisational resilience, independent of pre-intervention trait level resilience.

Hypothesis 4: Taking part in a wellbeing intervention will increase levels of wellbeing including employee self-rated health, work-related health and energy levels.

In response to recent claims that wellbeing interventions have a positive impact on organisational outcomes by increasing employees' attitudes which are linked to productivity (Luthans et al., 2010; Pipe et al., 2012), validated attitudinal measures of organisational support, job satisfaction, work engagement, organisational commitment, and turnover intentions will be surveyed pre and post intervention. Additionally, the relationship between these attitudinal variables and trait, employee and organisational levels of resilience will be explored. Based on previous literature, it is hypothesised that -

Hypothesis 5: Taking part in a wellbeing intervention will increase employees' perceptions of organisational support, job satisfaction, work engagement, and organisational commitment, and reduce turnover intentions.

Hypothesis 6: There will be a positive relationship between perceived organisational support, job satisfaction, work engagement and organisational commitment and trait, employee, and organisational resilience.

Returning to a theory posed earlier that perceptions of a supportive team will be positively associated with employee resilience (Näswall et al., 2015) this study also provides an opportunity to empirically explore the relationship between team commitment and levels of employee and organisational resilience. It has been found that high performing teams are those with higher levels of positivity and a tendency towards collaboration, than low performing teams (Losada & Heaphy, 2004). Specifically, positivity is associated with higher levels of team connectivity and responsiveness of team members to each other (Losada & Heaphy, 2004). Evidence from recent research also suggests the relationship may be reciprocal with team identification (or team engagement) triggering psychological wellbeing (Costa, Passos, & Bakker, 2014; Koo, 2014). Thus it is plausible that an organisation-

sponsored wellbeing intervention may enhance levels of team commitment for employees who participate in the Game in their work team.

Hypothesis 7: Participation in a wellbeing intervention in a work team will increase levels of team commitment more than participation as an individual.

Given internal relationships are also part of organisational resilience (McManus et al., 2008), being committed to a team is also hypothesised to enhance organisational resilience. In this vein, as it is argued that employees identify more with their team than their organisation (Richter, West, Van Dick, & Dawson, 2006), it is further hypothesised that employee resilience will have a stronger relationship with commitment to a work team than commitment to an organisation.

Hypothesis 8: High levels of team commitment will be related to high levels of employee resilience and organisational resilience

Hypothesis 9: Employee resilience will have a stronger relationship with team commitment than organisational commitment

Method

Design

A two-wave quantitative survey method, completed pre and post a wellbeing intervention (the Game), was used in this study. The length of time between the Time 1 and Time 2 surveys was one month. Participants who completed the survey at both times, but not the intervention, formed the control group.

Participants

Two organisations, a government department and a tertiary education provider, participated in this research. Employees from specific departments chosen by the organisations were invited to participate in a study on ‘employee wellbeing’. A total of 433

employees were invited to participate. Of these 433 employees, 216 took part in some, or all, components of the study. The participants were 183 females (85%), 29 males, and four with unspecified gender, with ages ranging from 19 to 67 years ($M = 42$, $SD = 11.94$). Overall, 216 participants completed the survey at Time 1 (50% response rate) and 123 completed the survey at Time 2. Out of the 216 participants at Time 1, 145 took part in the Game, and out of these, 82 participants completed the Time 2 survey. Please refer to Figure 1 below for the study procedure.

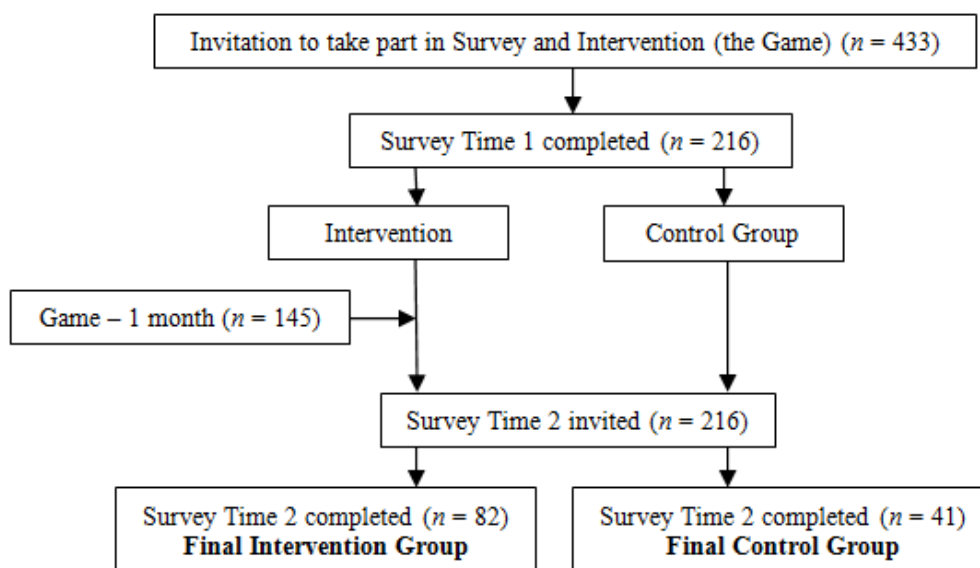


Figure 1. Participant Flow Chart

Materials

Demographics measured in the study included age (measured in years) and gender (listed as male, female, or other). Other measures related to the intervention included: Frequency of playing the Game (measured in hours of participation) and the Game qualitative feedback (participants' general feedback on their experience playing the Game). Due to organisational constraints on the length of the survey, and guided by the literature (Guadagnoli & Velicer, 1988), single item measures were used for four scales (work engagement, job satisfaction, self-rated performance and turnover intentions). For all scales, a higher score equals a more positive response to the item.

Employee Resilience was measured with the Employee Resilience Scale (EmpRes) (Näswall, Kuntz, Hodliffe, & Malinen, 2013). The EmpRes Scale has nine items on five point likert scales from 1 = ‘almost never’ to 5 = ‘almost always’. An example item is “*I effectively collaborate with others to handle challenges at work*”.

Trait Resilience was measured with the 10-item shortened scale from the 25 item Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) using a five point likert scale from 1 = “strongly disagree” to 5 = “strongly agree”. An example item is “*I am able to adapt to change*”.

Organisational Resilience was measured with the Resilient Organisations (ResOrg) Thumbprint tool (Lee et al., 2013) which operationalises resilience as a function of two factors, ‘Adaptive Capacity’ and ‘Planning’. Participants rated the 13 items on a five point likert scale with anchors being “strongly disagree” “disagree” “neither agree nor disagree” “agree” “strongly agree”, with an additional “don’t know” option. An example item is “*Given how others depend on us, the way we plan for the unexpected is appropriate*”.

Perceived Organisational Support was measured with a subscale from the Perceived Organizational Support scale (POS, Eisenberger, Huntington, Hutchison, & Sowa, 1986). In order to reduce the overall survey length, only three items; covering support, recognition and appreciation from the organisation, were chosen from the full scale. Participants were instructed to rate their responses on a seven point likert scale from 1 = “strongly disagree” to 7 = “strongly agree”. An example item is “*Help is available from the organisation when I have a problem*”.

Work Engagement was measured with a single item from Saks (2006) Work Engagement Scale, “*I am highly engaged in this job*”, with 1 = “strongly disagree” to 5 = “strongly agree”.

Organisational Commitment was measured with a three-item affective organisational commitment subscale from The Affective, Normative & Continuous Commitment scale (Meyer, Allen, & Smith, 1993). Participants are instructed to rate their responses on a seven point likert scale from 1 = “strongly disagree” to 7 = “strongly agree”. An example item is “*I would be very happy to spend the rest of my career with this organization*”.

Team Commitment was measured with the abovementioned three items of the affective organisational commitment subscale (Meyer et al., 1993) with a substitution of the word ‘organisation’ with ‘team’. An example item is “*I would be very happy to spend the rest of my career with this team*”.

Job Satisfaction was measured with one item from the Overall Job Satisfaction scale (Cammamm, Fichman, Jenkins, & Klesh, 1983), “*All in all, I am satisfied with my job*”. Participants are instructed to respond to this question on a five-point likert scale from 1 = “strongly disagree” to 5 = “strongly agree”.

Self-Rated Health was measured with three scales. The first item was “*How would you rate your health at the present time?*” by Idler, Kasl, and Lemke (1990). Participants were instructed to respond on a five-point likert scale from 1 = “bad” to 5 = “excellent”. The second scale consisted of three items from The Brief Fatigue Syndrome Scale (Frenzel, Åkerstedt, & Lisspers, 2008), including “*How energetic do you usually feel at work?*” Participants were instructed to respond on a five-point likert scale from 1 = “not energetic at all” to 5 = “very energetic”. The third scale consisted of three items from the Work-Related Health Attributions (Göransson et al., 2009) scale, in which participants were instructed to answer three items on a five-point likert scale from 1 = “strongly disagree” to 5 = “strongly agree”. An example item is “*I think I can continue to work as I do now and remain healthy in the long run*”.

Self-Rated Performance was measured with one item developed for this study: “*How would you rate your own performance over the past month compared to your average performance?*”, and was rated on a five-point likert scale with 1 = “much worse” to 5 = “much better”.

Turnover Intentions were measured with a one item scale (Vandenberghe & Bentein, 2009), “*I often think about quitting this organisation*”, with the word “quitting” replaced by “leaving” on the request of the participating organisations. Responses were recorded on a five-point likert scale, with 1 = “strongly disagree” to 5 = “strongly agree”.

Intervention

The Wellbeing Game (the Game) is a free online tool, owned and developed by the Mental Health Foundation of New Zealand. Participants join the game and compete as a team or as an individual. Participants document, against their game profile, the time they have spent on activities in their day-to-day lives which relate to one or more of the Five Ways of Wellbeing, for example; “I went for a walk with my colleague and she explained her current team project to me” (30 minutes) (Be Active, Connect, Keep Learning). Points are accrued for the time recorded. Throughout the Game players can accumulate ‘Badges’ by reaching the pre-determined target amount of time on an activity, or number of activities, related to each Way of Wellbeing. The intention of the game is that by raising awareness of what makes participants happy, participants will be inclined to do (and record) more of these activities, thus increasing both their wellbeing and game score. Game placings are based on the overall wellbeing points for a team, or those playing individually, recorded at the conclusion of the game. Further information on the game can be found in the procedure section below.

Procedure

The organisations approached to take part in the research were those who had an existing business relationship with the researcher. Each organisation had over 1000 employees, which was desirable for securing a sufficient pool of participants. Following a briefing by the researcher on the study process (see Organisational Flow Chart in Appendix A.1), organisational leaders chose the specific departments which could be potential participants in the research. Recruitment of participants was then made by a senior member of each of the participating organisations, with the assistance of programme ‘Champions’ (influential employees who were tasked with motivating other employees to participate). Firstly, all employees received an email introducing the project and explaining the purpose and procedure of the survey and Game (see Appendix A.2). Next, participants were emailed a link to the Time 1 survey on Qualtrics, an online survey tool (see Appendix A.3). The survey introduction explained the purpose of the study was to investigate employee wellbeing, all responses would remain confidential, participation was voluntary and participants could withdraw from the study at any stage. Contact details of the researchers were provided for questions or comments.

Participants were asked to provide informed consent, demographic information, and their work email address (which was later replaced by a four digit ID number). The survey remained open for 12 days to allow for adequate time for responding.

Next, the researcher emailed participants an invitation to take part in the Game and a join-up guide. Participants could self-select themselves into a team, play individually (as a team of one player), or exclude themselves from participating in the Game. First, self-selected Team Leaders registered their team for the Game, and then invited (via an emailed link to the team home page on the Game website) other members to join their team. All players registered with their work email address to enable the researchers to send emails

about the Game directly to the participants at work, rather than through a work supervisor or to participants' personal email address, and to make it clear to participants that the organisation was supportive of the intervention. To record an activity, participants clicked on the Play tab and typed a one sentence statement of recent activities in their day-to-day lives which involved one or more of the Five Ways to Wellbeing (see Appendix A.4). They then clicked on the relevant Five Ways to Wellbeing icon/s (Connect, Be Active, Keep Learning, Give, and Take Notice), time the activity took, and the avatar of any other team players involved in the activity. Players recorded activities at their chosen time, and weekly reminders were sent to players via the Game site to encourage participation. The Game ran for four weeks. During the Game, the researcher gave a prize for the first three players to achieve the 'Launched' Badge (recording 3 activities) and the first three players to achieve the 'Connect' Badge (recording 10+ Connect hours). At the Game's conclusion, Game scores for individuals and teams were calculated using the number of wellbeing hours recorded over the four weeks of the Game, with a log correction for number of players in the team. The team with the highest number of points in each organisation was deemed the Game winner and received a prize (a \$100 voucher).

Finally, all employees who completed the survey at Time 1 were sent the same survey for a second completion, with the exclusion of demographics items. The only additions to this survey were statements "*I participated in The Wellbeing Game*", "*I participated in The Wellbeing Game in a team comprised solely of members of my own work unit*", answered either 'yes' or 'no'. This survey remained open for 10 days. Incentives were offered for participants who completed both surveys (2 x \$100 gift voucher for each organisation). This study was reviewed and approved by the University of Canterbury Human Ethics Committee.

Results

SPSS Statistics Version 22 was used for all analyses. Two items from the work-related health scale, which had been intentionally written in the opposite manner to the other items in order to reduce response bias (Idaszak & Drasgow, 1987), were reverse coded.

First, to assess measurement properties of the scales and ensure the scales did not overlap, within and between-measure factor analyses, using principal axis factoring with oblique rotation, were run separately for the two organisations. The small sample sizes ($n < 150$) for each organisation resulted in a number of unacceptably low factor loadings (particularly for the between-factor measures). As this would potentially impact the reliability of the analyses (Comrey & Lee, 1992; Guadagnoli & Velicer, 1988), data from the two organisations was combined for the purpose of the factor analyses. This also ensured the consistency in factor structure between the two organisations.

Within-measures factor analyses will be discussed first. This will be followed by an in-depth examination of between-measures factor analyses for the resilience measures (given their centrality in the first research question), and conclude with data analysis and hypothesis testing.

Factor Analysis

The criteria for factor inclusion were eigenvalues greater than one, item factor loadings of greater than .40, items which loaded on only one factor (DeVellis, 2012), with no cross loadings of $> .3$ (Shultz & Whitney, 2005) and meeting assumptions for sphericity (Field, 2013). Listwise deletion was used to deal with missing data.

Within Measures Factor Analysis

KMO and Bartlett's tests for sphericity (significant correlations between the items) were significant ($>.7$, $p < .001$) for all analyses, (Hutcheson & Sofroniou, 1999) indicating sampling adequacy for factor analysis.

Employee Resilience

Using a Kaiser's criterion (Kaiser, 1960) for retaining factors with eigenvalues >1 , the initial factor analysis for employee resilience indicated two factors. However, further inspection of the scree plot (Cattell, 1978; Shultz & Whitney, 2005) indicated the point of inflection rested at component number two, and the second factor only explained 8.64% of the proportion in variance (compared to Factor 1, 35.44%). These facts, when taken together with contemporary views that Kaiser's Criterion tends to over-extract factors (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Field, 2013; Patil, Singh, Mishra, & Todd Donovan, 2008), supported the decision to re-run the analysis stipulating the extraction of only one factor. All items had a desirable factor loading of above 0.5 (see Table 1 in Appendix B). Using all the items, an internal consistency of $\alpha = 0.82$ was found.

Organisational Resilience

Item OR06 "*There are few barriers to stop us from working well with other organisations*" was discarded due to its low communality ($h^2 = .16$) and a low factor loading (.19). After re-running the analyses without this item, the factor analysis indicated two meaningful factors for organisational resilience based on the scree plot and Factor 1 eigenvalue of 4.50 with 38.0% of the variance accounted, and Factor 2 eigenvalue 1.32 with 10.96% of the variance accounted for. Consistent with findings of the authors of this measure (Lee et al., 2013), Factor 1 items related to an organisation's adaptive capacity, and Factor 2 items related to an organisation's planning. Internal consistencies of $\alpha = 0.84$ (adaptive capacity) $\alpha = 0.82$ (planning) were found (see Table 2 in Appendix B).

Trait Resilience

Item TR03 “*I can see the humorous side of things*” was discarded due to its low communality ($h^2 = .12$) and factor loading (.34). The factor analysis was re-run and resulted in one meaningful factor, with 44.01% of the variance accounted for, and had an internal consistency of $\alpha = 0.87$ (see Table 3 in Appendix B).

Attitudinal and Wellbeing Dependent Variables

Separate factor analyses were conducted for each of the attitudinal and wellbeing dependent variables in the study (organisational support, job satisfaction, work engagement, organisational commitment, and turnover intentions). As expected, these resulted in one meaningful factor for each dependent variable (see Tables 4–8 in Appendix B). The following internal consistencies were obtained: perceived organisational support $\alpha = 0.85$ (Table 4), organisational commitment $\alpha = 0.88$ (Table 5), team commitment $\alpha = 0.88$ (Table 6), self-rated health $\alpha = 0.73$ (Table 7), work-health $\alpha = 0.84$ (Table 8).

Between Measures Factor Analyses

Employee Resilience and Organisational Resilience

To ensure independence of the resilience measures (in line with *Hypothesis 1*), between factor analyses were run for pairs of the measures, including two resilience measures at each time (sample size restricted including more than two measures in each factor analysis). As per the findings from the within factor analyses, between-construct factor analysis for employee resilience (1 factor) and organisational resilience (2 factors) was run stipulating three factors (see Table 9 in Appendix B). The scree plot, the fact that employee resilience and organisational resilience items loaded on different factors, and the small inter-factor correlations supported the argument that employee resilience is a separate construct from both the organisational resilience Factors.

Employee Resilience and Trait Resilience

As per the within-factor analyses, employee resilience and trait resilience factor analysis was run stipulating two factors (see Table 10 in Appendix B). Examination of the pattern matrix showed items for employee resilience and trait resilience loaded clearly on two separate factors which were correlated to only a moderate extent. The only exception was item ER08 “*I use change at work as an opportunity for growth*”, which loaded on both Factor 1 and 2. As item ER08 loaded as expected on Factor 2 (employee resilience), the measures were not used to predict each other, there were no cross-loadings with any other measures in the study, and the correlation between factors was not strong ($r = .55$), it was deemed acceptable to retain this item with the expected Factor 2 (employee resilience) (Shultz & Whitney, 2005). Thus, overall, employee resilience can be deemed a distinct construct from trait resilience.

Trait Resilience and Organisational Resilience

As per the findings from the within-factor analyses, trait resilience and organisational resilience factor analysis was run stipulating three factors (see Table 11 in Appendix B). Examination of the pattern matrix showed items for trait resilience and organisational resilience loaded clearly on separate factors, with only a weak correlation.

Between factor analyses of resilience, attitudinal and wellbeing variables

In order to ensure that variables were not overlapping between the dependent and independent variables, between factor analyses were run with two scales at a time (for example, employee resilience and organisational commitment). All the findings supported separate dimensions as expected. In addition, the dimensionality of the independent variables were tested to ensure there was no measurement overlap. The results supported the separate dimensions as expected.

Data Analyses

Repeated measures analysis of variance (ANOVA or ANCOVA) was used to analyse the data. All assumptions: normality, homogeneity of variance, independence, and sphericity, were checked. Kolmogorov-Smirnov and Shapiro-Wilks tests were violated for all dependent variables ($p < .05$), indicating their distributions differed significantly from a normal distribution. Hence, further inspection of data was conducted to check for potential outliers (Field, 2013). Using the criteria of z scores >3 (Field, 2013), six outliers (Cases 20, 67, 86, 126, 134 and 178) were removed. After outlier removal, all variable skewness and kurtosis distributions fell between -1 and +1, and Cook's distance indicated no values were greater than 1, thus satisfying the assumptions of normality. Levene's test for equality of error variances was significant at $p < .05$ for the work-health and organisational commitment scales, however, when their variance ratios were taken into consideration (1.69 and 1.49 respectively) (Pearson & Hartley, 1954), homogeneity of variances can be assumed for all variables. In addition, for the Analysis of Covariance (ANCOVA) (*Hypothesis 3*), independence of covariate (trait resilience) and treatment effect (i.e., condition) was investigated. No significant differences were found in the covariate between the Control and the Experimental groups. Therefore, the decision was made to continue the analyses with the six outliers removed ($n = 216$).

Descriptive statistics, reliability coefficients and correlations between variables (at Time 1) are presented in Table 1.

Table 1

Time 1 Combined Organisation Sample Means, Standard Deviations, Coefficient Alphas (in Brackets on the Diagonal), and Correlations between Variables

		<i>Range</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1	EmpRes	1-5	4.13	.48	(.82)												
2	TraitRes	1-5	3.89	.54	.55**	(.87)											
3	OrgRes AC	1-5	3.65	.62	.22**	.19**	(.84)										
4	OrgRes P	1-5	3.99	.63	.17**	.21**	.49**	(.82)									
5	PerceivedSup	1-7	4.67	1.24	.28**	.28**	.42**	.29**	(.85)								
6	OrgComm	1-7	4.66	1.46	.38**	.27**	.31**	.09	.57**	(.88)							
7	TeamComm	1-7	4.92	1.34	.30**	.17*	.14	.12	.30**	.55**	(.88)						
8	Self-Health	1-5	3.67	.74	.33**	.33**	.25**	.27**	.23**	.22**	.14	(.73)					
9	Work-Health	1-5	3.43	.90	.26**	.23**	.31**	.20**	.39**	.39**	.34**	.47**	(.84)				
10	Engagement	1-5	4.04	.88	.39**	.31**	.18**	.06	.35**	.58**	.49**	.24**	.39**				
11	JobSatisfaction	1-5	3.85	.95	.38**	.30**	.22**	.13	.44**	.58**	.50**	.35**	.50**	.79**			
12	TurnoverInt	1-5	2.45	1.16	-.18*	-.08	-.20**	-.11	-.28**	-.46**	-.30**	-.17*	-.46**	-.39**	-.47**		
13	EnergyLevels	1-5	3.59	.85	.37**	.42**	.23**	.20**	.31**	.37**	.30**	.62**	.50**	.48**	.50**	-.24**	
14	SRPerf	1-5	3.26	.75	.27**	.19**	.24**	.13	.18*	.21**	.10	.26**	.23**	.23**	.22**	-.11	.37**

Note: $n=216$; OrgRes AC & EnergyLevels $n = 214$; * $p < .05$, ** $p < .01$; EmpRes = Employee Resilience; TraitRes = Trait Resilience; OrgRes AC = Organisational Resilience adaptive capacity; OrgRes P = Organisational Resilience planning; PerceivedSup = Perceived Organisational Support; OrgComm = Organisational Commitment; TeamComm = Team Commitment; Self-Health = Self-Rated Health; Work-Health = Work Health; Engagement = Work Engagement; JobSatisfaction = Job Satisfaction; TurnoverInt = Turnover Intentions; EnergyLevels = Energy Levels; SRPerf = Self-Rated Performance

Research Question 1: Exploring the Relationships between Trait, Employee and Organisational Resilience.

Hypothesis 1, looking at the interrelationships between the resilience variables, was tested (see Table 1). Furthermore, the Time 1 correlations for the resilience variables for each organisation were examined to investigate any potential differences between organisations (see Table 12 in Appendix C). Combined organisational data will be discussed first, followed by a discussion on the differences in data found between the two organisations.

The results supported *Hypothesis 1*, which stated that there would be positive relationships between all resilience variables at Time 1. Additionally, of interest, a t-test indicated that Time 1 mean levels of employee resilience were significantly higher ($p < .005$) than for trait resilience. The strengths of the correlations of the resilience and dependent variables were then compared. Employee resilience had a significantly ($p < .005$) stronger relationship than trait resilience with organisational commitment, team commitment, self-rated health, work-health, work engagement, and job satisfaction.

Here forth, where appropriate, organisational resilience will be referred to as either its ‘adaptive capacity’ or ‘planning’ Factor. For the combined organisational data (see Table 1), there was a moderate positive relationship between trait resilience and employee resilience and a small positive relationship between both employee resilience and adaptive capacity and planning, and trait resilience and adaptive capacity and planning. Further, for *Hypothesis 2*, it was expected that the relationship between employee resilience and organisational resilience would be stronger than the relationship between trait resilience and organisational resilience. Whilst employee resilience had the stronger relationship with adaptive capacity, trait resilience had a stronger relationship with planning. Thus *Hypothesis 2* was only supported by adaptive capacity. Employee resilience, trait resilience and adaptive capacity had significant positive relationships with all attitudinal and wellbeing variables with the

following exceptions: trait resilience was not related to turnover intentions, and adaptive capacity was not related to team commitment. Planning had significant positive relationships with perceived organisational support, self-rated health, work-health and energy levels.

Investigation of the differences in the organisational samples (see Table 12 in Appendix C) revealed organisation A and B had similar patterns of significant correlations between employee and trait resilience, and between adaptive capacity and planning. Where the two organisations differed was in relation to the significant correlations found between organisational resilience and the other resilience variables. For organisation A, planning had a significant correlation with trait resilience, whilst for organisation B, adaptive capacity had significant correlations with both employee resilience and trait resilience.

Research Question 2: Exploring the Impact of a Workplace Wellbeing Intervention on Employee and Organisational Resilience.

Pre and post-intervention means and standard deviations for the resilience, wellbeing and attitudinal variables can be found in Table 13 in Appendix D.

Recent research on the effects of workplace wellbeing interventions has suggested that employees starting from a low level of engagement are more likely to benefit from a wellbeing intervention than employees already high in engagement (Schaufeli et al., 2013). Thus, in order to assess whether any significant effects were a function of pre-intervention engagement levels, a t-test for independent means (Experimental vs. Control) was conducted prior to further hypotheses testing. The results indicated there was no significant difference in levels of work engagement at Time 1 for employees who participated in the Game and those who did not ($M_{Game} = 4.06$ vs. $M_{Control} = 4.02$; $t(131) = .461$, $p = .794$).

For *Hypothesis 3*, a 2 (Time: pre vs. post-intervention) x 2 (Organisation: A vs. B) x 2 (Condition: Game vs. Control) mixed design Analysis of Covariances (ANCOVAs) with trait resilience as a covariate and Time as the within-subjects factor was conducted to investigate

whether an organisation-sponsored wellbeing intervention could increase employees' levels of employee resilience and organisational resilience (independent of pre-intervention trait resilience). Organisation was used as a factor to account for any potential differences between the samples. Here forth, effect sizes denoted by partial eta squared (η_p^2) can be interpreted as: $>.01$ (small effect), $>.06$ (medium effect), $>.14$ (large effect) (Field, 2013; Pallant, 2007). No significant main effects were found. However, the Condition x Time interaction for employee resilience was significant when using the more liberal p-level of $p < .10$, with $F(1, 128) = 2.914, p = .090, (\eta_p^2 = .02)$ (Time 1 $M_{Game} = 4.19$ vs. $M_{Control} = 4.16$, Time 2 $M_{Game} = 4.24$ vs. $M_{Control} = 4.06$) (see Figure 2). Thus, Time 2 employee resilience levels were higher as a function of playing the Game. No other significant interactions were found.

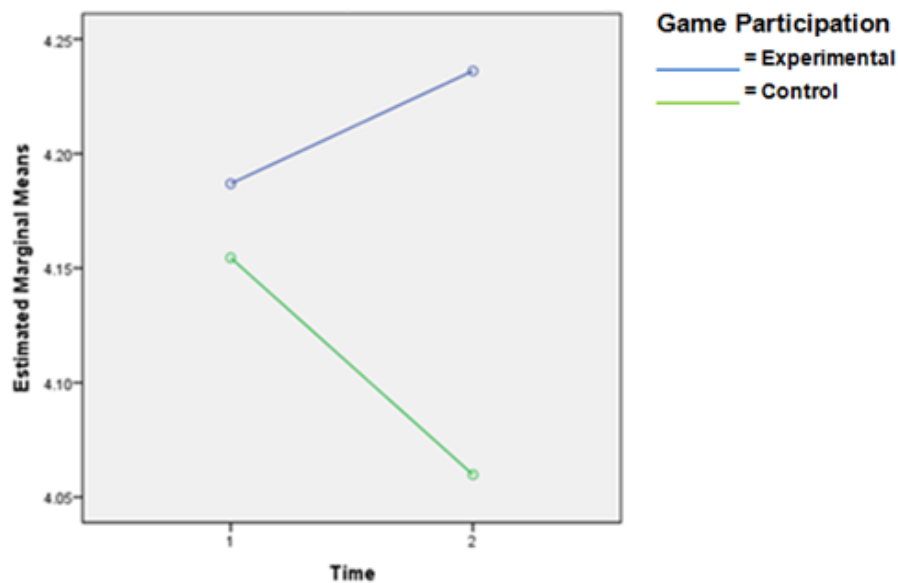


Figure 2: The effects of Time (pre vs. post-intervention) and Condition (Game vs. Control) on Employee Resilience, with Trait Resilience as a Covariate. Note: Scales have been amended to a range of 4.05–4.25 for clarity.

For Hypotheses 4 and 5, investigating the impact of the Game on the attitudinal and wellbeing variables, a 2 (Time: pre vs. post intervention) x 2 (Organisation: A vs. B) x 2 (Condition: Game vs. Control) mixed design ANOVA, with Time as the within-subjects

factor was conducted. Means and standard deviations for the resilience, wellbeing and attitudinal variables for the conditions at Time 1 and Time 2 appear in Table 13 (Appendix D). No significant main effects were found. However, a significant interaction of Condition x Time was found for self-rated health, $F(1, 129) = 4.995$ $p = <.05$, ($\eta_p^2 = .04$) (Time 1 $M_{Game} = 3.71$ vs. $M_{Control} = 3.71$, Time 2 $M_{Game} = 3.78$ vs. $M_{Control} = 3.50$) (see Figure 3). Hence, Time 2 self-rated health levels were higher as a function of playing the Game.

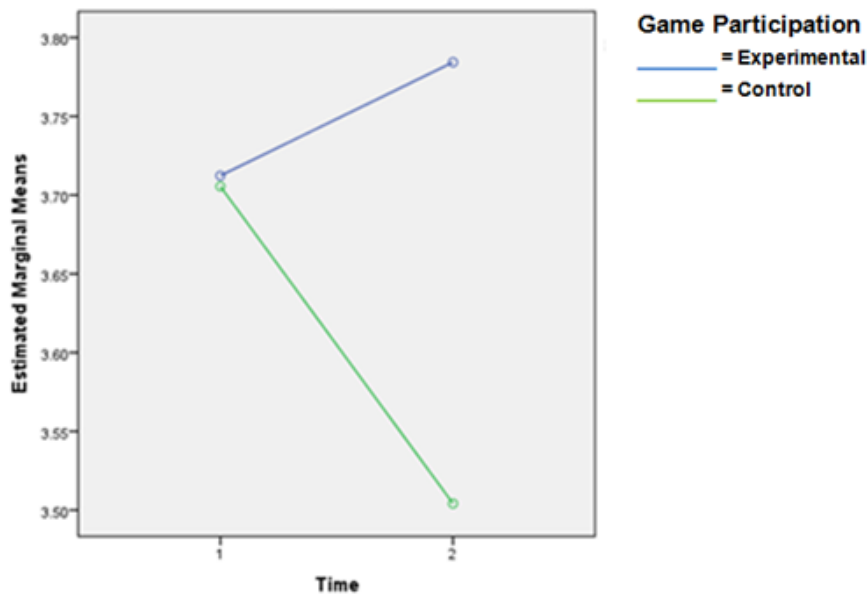


Figure 3: The effects of Time (pre vs. post-intervention) and Condition (Game vs. Control) on Self-Rated Health. Note: Scales have been amended to a range 3.50-3.80 for clarity

Thus, it was concluded that taking part in the wellbeing intervention resulted in significant increases in general wellbeing and modest increases in employee resilience at the more liberal $p < .10$ level of significance, but not in any changes to work-related health. Whilst mean levels increased to a small extent after participating in the Game for organisational resilience, work-health, energy levels, and employee attitudes (except work engagement) these increases were not statistically significant. No significant differences between organisations were found in any of the above analyses.

For Hypotheses 6, 8 and 9, Time 1 data was used. Hypothesis 6 stated that perceived organisational support, job satisfaction, work engagement, and organisational commitment

would be related to trait resilience, employee resilience and organisational resilience. The results of the analysis found that levels of employee resilience, trait resilience and adaptive capacity were significantly and positively related to perceived organisational support, job satisfaction, work engagement and organisational commitment. For planning, a positive significant relationship was only found with perceived organisational support (see Table 1). Thus *Hypothesis 6* was partially supported.

For analysis relating to *Hypotheses 8*, which stated that team commitment would be related to employee resilience and organisational resilience, the results demonstrated that team commitment had a significant, positive relationship with employee resilience but not organisational resilience. Thus the hypothesis was only partially supported (see Table 1). Further, for *Hypothesis 9*, which stated that employee resilience would have a stronger relationship with team commitment than organisational commitment, whilst employee resilience had significant, positive relationships with both team commitment and organisational commitment, using the Fisher r to z transformation (with a negative z score indicating the r score for team commitment is smaller than that of organisational commitment) the relationship was significantly stronger ($p < .005$, $z = -.93$) with organisational ($r = .38$), rather than team commitment ($r = .30$). Thus *Hypothesis 9* was not supported (see Table 1).

For *Hypothesis 7*, testing whether playing the Game in a work team would increase team commitment, a mixed design ANOVA with 2 (Game: team vs. individual) x 2 (Time: pre vs. post-intervention) x 2 (Organisation: A vs. B), with Time as the within subjects factor, was conducted. This analysis was only for employees who participated in the Game and completed the Time 2 survey ($n = 82$). Mean levels of team commitment increased to a modest extent for employees who played the Game in a work team (Time 1 $M = 4.78$ vs. Time 2 $M = 4.89$), compared to a small decrease for those who played as individuals (Time 1

$M = 5.62$ vs. Time 2 $M = 4.88$). No significant main effects were found. However, a significant interaction of Condition x Time was found at a more liberal level $F(1, 77) = 2.766, p = .100; (\eta_p^2 = .04)$ (see Figure 4). Thus, whilst not significant at the traditional $p < .05$ level, Time 2 levels of team commitment were higher as a function of playing the Game in a work team.

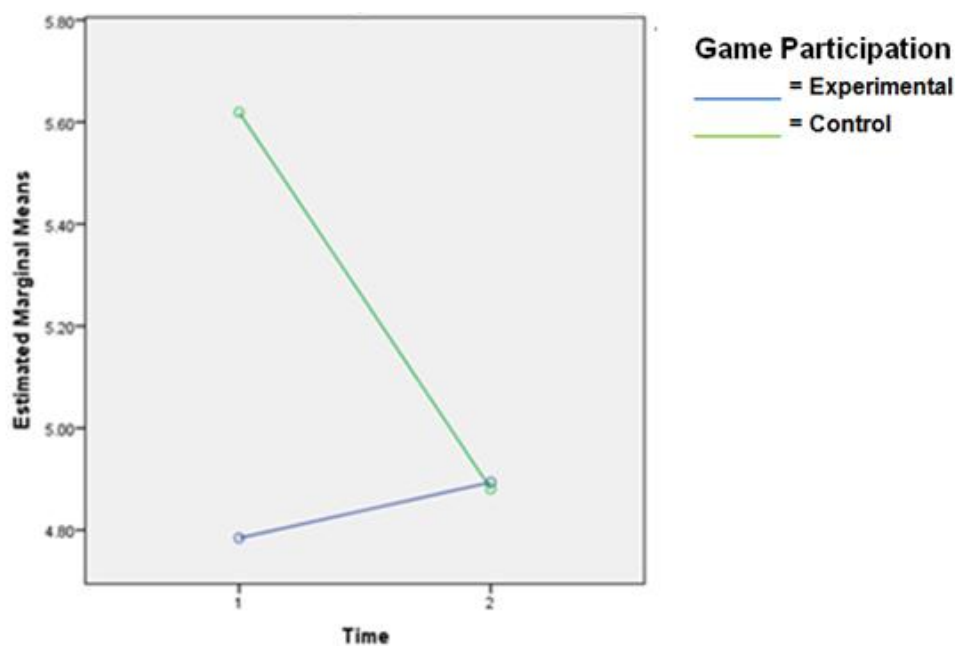


Figure 4: The effects of Time (pre vs. post-intervention) and Condition (Game: Team vs. Individual) on Team Commitment. *Note: Scales have been amended to a range of 4.80 -5.0 for clarity*

Impact of the Frequency of Playing the Game on Dependent Variables

In order to further investigate any potential effects that playing the game may have had on the dependent variables, Game data were analysed in terms of number of hours of player participation. Mixed design ANCOVAs of 2 (Time: pre vs. post-intervention) x 2 (Organisation: A vs. B) with Game Time as a covariate and Time as the within subjects factor was conducted for all the dependent variables. No significant effects were found of time reported.

Discussion

Given the constantly changing and unpredictable environments which today's organisations are required to work in, the need for both organisational and employee resilience has never been more crucial for organisational success. The organisational psychology literature has recently begun documenting the benefits of focusing on both *employee wellbeing*: increased individual resources to cope with change and enhanced productivity (Bardoel et al., 2014), and *employee resilience*: increased adaptation and thriving in response to necessary organisational changes (Näswall et al., 2015; Shin et al., 2012). However, whilst researchers now acknowledge the existence of employee resilience alongside the more commonly studied trait and organisational-level resilience, to date, the literature fails to provide any clear understanding of how these levels of resilience interact, and how they may be influenced. As there are also many logistical reasons for organisations not to invest in employee wellbeing and resilience (Abbott et al., 2009; Meyers et al., 2013), there is a clear and immediate need for guidance to organisations in practical ways to invest in employee psychological resources which benefit both employees and the organisation.

The primary aims of the current research were two-fold; first, to empirically investigate previously untested assumptions of how resilience at individual, employee and organisational-level interact, and second, to investigate whether supporting the wellbeing of employees at work may act as an 'organisational enabler' of employee-level resilience. It was predicted that there would be positive relationships between trait, employee, and organisational-level resilience, with organisational resilience having a stronger relationship with employee resilience than it does with trait resilience.

In addition, it was expected that participation in a wellbeing intervention, the Game, would not only enhance employee wellbeing and positive attitudes towards the organisation, but also levels of employee and organisational resilience. Further predictions were made with

regards to work teams: participating in the Game as part of a work-team would enhance team commitment, more-so than participating as an individual; there would be significant positive relationships between team commitment and employee and organisational resilience, with the stronger relationship being between team commitment and employee resilience. First, a summary of the findings will be presented, followed by a discussion of these findings and implications. This section will conclude with limitations of this study and suggestions for future research on understanding and developing resilience in a work context.

Interrelationships Between Resilience Variables

As expected, positive relationships were found between trait, employee and organisational-level resilience (*Hypothesis 1*). These results support arguments that a resilient organisation is comprised of resilient employees (Bardoel et al., 2014; Lengnick-Hall et al., 2011). This is an important and novel finding, as it suggests that an organisation's investment in employee resilience may have a reciprocal relationship whereby increasing employee resilience may in turn increase organisational resilience. However, as the correlations between employee resilience and organisational resilience, whilst significant, were somewhat small (adaptive capacity $r = .22$, planning $r = .17$), caution must be taken in interpreting these results. Notwithstanding, this finding reinforces the theory that, when considering the resilience of an organisation, focus must be given to the resilience of its employees (Lengnick-Hall et al., 2011).

Crucial to developing an understanding of how trait and employee resilience relate and differ, levels of employee resilience were significantly higher than levels of trait resilience. That is, the people in this study reported experiencing higher levels of resilience at work than in general. As supported by the between-measures factor analyses, whilst employee resilience and trait resilience share similarities, they are not the same psychological construct. Indeed, the evidence indicated that, whilst trait resilience has a significant positive

relationship with employee resilience, further analysis suggested that they only share 31% of the variance, indicating that most of the variance in employee resilience is due to factors other than individual resilience. Specifically, the results provide support for the context-dependent nature of employee resilience, in that there are specific enablers of resilience exclusive to the work environment which do not have the same impact outside of this context (e.g. on trait resilience) (Gillespie et al., 2007; Southwick et al., 2014). The findings also add to the growing body of research which argues that resilience at work should and can be developed (Luthans et al., 2006; Näswall et al., 2015; Shin et al., 2012). Early theorists argued that leaders should build resilience in employees by re-phrasing crises as ‘developmental challenges’ (Bass, 1990). Conversely, employee resilience theory argues that the extent to which the organisation provides work-related resources influences the enactment of resilient workplace behaviours (i.e., employee resilience) (Näswall et al., 2015). The findings of this study highlight the importance of further research which also investigates how an organisation may provide the necessary conditions to support employees’ resilient behaviour required for building the collective capacity for resilience within an organisation (Lengnick-Hall et al., 2011; Näswall et al., 2015).

When evaluating which of the individual-level constructs of resilience (employee resilience or trait resilience) had the stronger relationship with organisational resilience (*Hypothesis 2*), the findings were mixed. It was hypothesised that employee resilience would have a stronger relationship with organisational resilience as compared with trait resilience. However, employee resilience had the stronger relationship with adaptive capacity, whilst trait resilience had the stronger relationship with planning. Analysis of differences between the two organisations in the relationship between these variables revealed that the two organisations differed in the extent the two factors of organisational resilience were related to trait resilience and employee resilience. Organisation A had a significant relationship

between planning and trait resilience only. Organisation B had significant relationships between adaptive capacity and both trait resilience and employee resilience. Together, these results indicate that, whilst trait and employee resilience are related to organisational resilience, the relationships are complex and there may be challenges measuring these relationships. To further understand these findings, the factors in the organisational resilience measure were examined. The relationship between employee resilience (the adaptive capacity of the employee) and the organisations' adaptive capacity is a logical one since both constructs involve adapting to change. Having adaptable employees is related to a more adaptable organisation. In turn, the weaker relationship with employee resilience and the organisation's planning may be a consequence of planning being more directly related to executive employees than non-executives, as a result of limited transparency of organisational planning and staff participation in crisis response exercises (Lee et al., 2013). Notwithstanding, the finding that planning was more strongly related to trait resilience than employee resilience, is unexpected. Given the small correlations ($r = .17$ – $r = .55$) found between organisational, trait and employee resilience, an alternative explanation could be that some, or all, of the resilience relationships with organisational resilience were spurious. Indeed, a long-standing criticism of findings in the social sciences is that everything weakly correlates to some extent with everything else (Crud Factor) (Cummins, 2011; Meehl, 1990). As this is the first time the organisational resilience measure has been correlated with resilience at an individual level, these findings clearly point to the importance of further research in this area. A further discussion on the findings and limitations from the ResOrg measure (Lee et al., 2013) follows throughout this discussion.

In line with previous research (Luthans et al., 2010; Näswall et al., 2015; Neubert & Cady, 2001; Pipe et al., 2012; Shin et al., 2012) it was hypothesised that employee, trait and organisational resilience would be positively related to four key psychological predictors of

organisational performance (Barrick, Thurgood, Smith, & Courtright, 2015; Tsai, Cheng, & Chang, 2010): perceived organisational support, job satisfaction, work engagement and organisational commitment (*Hypothesis 6*). The results were mainly supported, with the exception of planning only being related to perceived organisational support and not the other attitudinal variables. Again this raises questions around the organisational resilience measure, which will be discussed further under the section on study limitations and future directions.

Notably, employee resilience, unlike organisational and trait resilience, was in fact significantly related to *all* attitudinal *and* wellbeing variables in the study: Employee resilience had a stronger relationship than trait resilience with organisational commitment, team commitment, self-rated health, work health, work engagement and job satisfaction. It is also noteworthy that employee resilience, not trait resilience, was positively related to an employee's intentions of leaving the organisation. These results further highlight the unique value of employee resilience and provide additional evidence of employee resilience being distinguishable from the other resilience variables.

On the practical side, the results of this study indicate that those with high employee resilience were less likely to want to leave their job. The detrimental effects of employee turnover may include loss of specialist knowledge, reduced motivation of remaining employees and prevent objectives from being met (Mobley, 1982). Managers may be able to reduce employee turnover through introducing changes in leadership style and organisational culture which enable employee resilience (Kuntz, Näswall, & Malinen, 2015), without having to undertake human resource strategies such as job re-design (Hackman & Oldham, 1975). Furthermore, participants in the study rated their energy levels as being the variable most related to their performance at work, with the second strongest relationship with performance being employee resilience. Additionally, the extent that participants felt resilient at work (employee resilience) was more strongly associated with their reports of work performance

than any of the other work-related attitudes or indicators of wellbeing (excluding energy levels) measured in the study. Other studies on predictors of job performance, such as affective organisational commitment (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002), often find relationships of the magnitude of $r = .12$ (between performance and commitment), which makes the current finding of $r = .27$ (between self-rated performance and employee resilience) encouraging. Additional regression analysis indicated that, even when organisational commitment was controlled for, employee resilience was a significant predictor of self-rated performance, suggesting that employee resilience can be a useful predictor of performance in future research. These findings suggest that employee resilience goes beyond merely feeling good at work and having positive resilient attitudes, to acting out effective resilient behaviours and thereby relating to employees' perceived level of performance.

Given the cost of recruiting, selecting, training and managing replacement employees has been estimated to be at least equal to the job's annual salary (SHL, 2004), it is not unrealistic to also argue that there are financial implications associated with having a resilient workforce. It is not suggested here that organisations should recruit for resilience, however, prior to developing workplace initiatives, it is important to have a 'work-specific' baseline measure of the overall resilience of employees in the organisation, which ask respondents to consider questions specifically in a work context (e.g. the Employee Resilience Scale) (Näswall et al., 2013), as opposed to using general personality measures (NEO-PI-R) (Costa & McCrae, 1992).

Team Commitment

Past research has found that internal relationships are important to both employee and organisational resilience (McManus et al., 2008; Näswall et al., 2015). Therefore, additional to the primary research questions, the significance of team commitment in relation to

employee and organisational resilience was investigated. Interestingly, as expected, being committed to a team was related to the enactment of resilient employee behaviours (employee resilience). This supports previous research which found that, when faced with a specific work challenge, employees with the greatest levels of resilience were those who listed the support of a leader *and* a co-worker as a factor in dealing with the challenge (Harland, Harrison, Jones, & Reiter-Palmon, 2005). Indeed, additional regression analysis suggested that perceived organisational support and team commitment are significant predictors of employee resilience for participants in this study. However, being committed to a team was surprisingly not related to the overall resilience of the organisation (organisational resilience). Furthermore, stronger than the relationship found between team commitment and employee resilience was that of organisational commitment and employee resilience. Whilst this finding was unexpected, as research indicates that organisational commitment is developed through having needs at work met (Meyer et al., 2002), it does give weight to the suggestion that the organisation (through supervisors), rather than team members, can provide the resources and support which enables employee resilience (Hobfoll, 2001; Näswall et al., 2015). Thus, it is simply not sufficient for organisations to solely rely on team members to bolster each other through inevitable work challenges and disruptions arising from the need for organisational change. Employers must take deliberate steps to support the resilience of their employees by providing enabling resources, such as effective leadership and supportive supervision.

Whilst it is difficult to make causal links between psychological variables and organisational outcomes (Meyers et al., 2013) (including those in this research due to its cross-sectional design), the results of this study have shown that the more resilient an employee feels the more likely they are to feel supported, satisfied, engaged and commitment to their organisation. These four variables are widely held in the literature as key contributors

of organisational performance (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001; Judge, Thoresen, Bono, & Patton, 2001; Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989; Riggle, Edmondson, & Hansen, 2009; Saks & Gruman, 2011). Hence, organisations would be well served by investing in enablers of employee resilience.

The Impact of the Game on the Resilience, Attitudinal and Wellbeing Variables

The second main research question investigated whether supporting the wellbeing of employees at work may act as an ‘organisational enabler’ of employee-level resilience and organisational resilience (*Hypothesis 3*). Participants’ levels of employee resilience changed at the more lenient ($p < .10$) level of significance following playing the Game, as did the levels of team commitment for those who played the Game as part of their work team. Contrary to expectations, participants’ perceptions of organisational resilience and attitudes towards the organisation remained unchanged. Whilst mixed results were achieved, the fact that this is the first research of its kind to attempt to relate employee wellbeing to organisational resilience makes these interesting findings which should be explored in future research. In turn, the stability of levels of trait resilience following the wellbeing intervention supported our expectations, suggesting that trait resilience is not readily developed through organisation-sponsored workplace interventions (Shin et al., 2012).

What is surprising was the lack of change found in employees’ organisational attitudes, which is in contrast to the literature which has increasingly found wellbeing to influence how an employee feels about their work (Luthans et al., 2010). It may be that, whilst the Game did not change participants’ perceptions of their job itself, it could have changed perceptions of other aspects of their working environment. Additionally, these results may indicate that participants did not necessarily perceive their organisations’ sponsorship of the intervention as a sign of support for their wellbeing, which will be discussed shortly.

As expected, employee resilience was significantly influenced through the provision of the wellbeing intervention, second in significance only to self-rated health. In support of previous research (Luthans et al., 2010; Shin et al., 2012), this finding indicates that employee resilience is indeed susceptible to development.

When designing the study, it was believed that employees would view the provision of the wellbeing intervention as a sign of the organisation's support for their welfare (Näswall et al., 2015; Shin et al., 2012), which was then expected to increase resilience, and result in more positive workplace attitudes and employee wellbeing. Yet, participants did not report any notable increase in perceived organisational support following playing the Game. As previously discussed, organisational rewards and work conditions, whilst important, are not exclusive pre-requisites for a supportive work environment. A major antecedent of perceived organisational support is employees' belief that the organisation (through the acts of supervisors) cares about them (Eisenberger et al., 2001). Thus, given that each organisation had over 1000 employees, it is conceivable that employees would have more closely related the intervention as a provision of their supervisor (supervisor support), whose actions were more visible, rather than their organisation as such. Conversely, support from the organisation in the form of rewards or promotion may be much more important in contributing to perceptions of organisational support than this type of game. Thus, the intervention used in this study (the Game) may not have been the best illustration of perceived organisational support.

As expected, participants reported an improvement in their general wellbeing (self-rated health, including improved quality of sleep and ability to concentrate) (*Hypothesis 4*) following participation in the Game. This is consistent with contemporary literature on positive psychology workplace wellbeing interventions in general (Meyers et al., 2013) and with the preliminary evaluation of the Game (Green, 2014). Whilst this was not the primary

focus of the study, it is an important finding as the reported improvements in general wellbeing may subsequently result in reduced absenteeism, which in turn has been found to be related to improved performance (Seifert, 1995).

Contrary to expectations, no improvements were found in participants' reported work-related health, in which the employee believes their job negatively affects their health (*Hypothesis 4*). It was hypothesised that by increasing participants' levels of positivity via the Game, this would in turn positively influence participants' appraisals of the extent which work demands impacted on their health. As, to the best of the researcher's knowledge, this is the first time this measure has been used before and after a wellbeing intervention, this is an interesting finding, suggesting the need for future workplace wellbeing research with this measure. It is also conceivable that the Game was not influential enough, perhaps due to the Game running for an insufficient duration to see any significant effects on work-related health. Furthermore, the expectation that energy levels would increase after participating in the Game (*Hypothesis 4*) was also not realised. This is in contrast to the moderate effect found on energy levels (measured as Vigor) following a different workplace wellbeing intervention (Aikens et al., 2014b). However, the comparison study given here was much more intensive and time demanding on participants than that used in the current study.

Whilst playing the Game with other work-team members seemed to increase commitment to that team (*Hypothesis 7*), the amount of time spent playing the game did not appear to make a difference to participants' resilience, wellbeing or work-related attitudes. This was a surprising result given medium sized effects on wellbeing were found in a preliminary study utilising the Game (Green, 2014), with higher levels of engagement in the Game being related to higher levels of wellbeing. However, it is important to note that the current study measured player engagement via hours played, as opposed to engagement categories used in the preliminary evaluation of 'sign-ups', 'starters', 'participators' (playing

more than three times per week), and ‘finishers’ (Green, 2014). This form of data was not available to the researchers in the current study, and it is possible that the differences in the measures used in the preliminary and current study may have resulted in the inconsistent findings. It seemed that the amount of time of playing the Game, as measured in this study, did not make a difference to participants’ wellbeing, resilience and attitudes. Rather, data from the preliminary evaluation suggests that participants need to continually play at least three times per week to see a significant result.

Additional to potential influences on the findings discussed, consideration must be given to the characteristics of the participants. Contrasting views have been argued for who should be selected to participate in wellbeing interventions. Huppert et al. (2005) suggest wellbeing should be increased for all employees, whilst Vanhove et al. (2015) argue employees with the lowest levels of resilience should be targeted (to achieve the largest effect size). Another view is that only core employees, who make the greatest contribution to organisational success, should be targeted (Lengnick-Hall et al., 2011). A similar positive psychology workplace wellbeing intervention to this study has demonstrated that those with low levels of work engagement achieved the most significant effects on the wellbeing measures (Schaufeli et al., 2013). The researchers argued that participants who would potentially benefit most from this intervention were those who were the most likely to drop out of the intervention or not even start it (Schaufeli et al., 2013). As the organisations in the current study chose who to invite to participate, and participants self-selected to play the Game, it was not possible to fully explore this finding. However, there were no significant differences in Time 1 levels of employee engagement, resilience or wellbeing between participants who played the Game and the control group who only completed the surveys.

Limitations and Future Research

As with all research, some limitations need highlighting. The literature has shown that previous workplace interventions, such as resilience training, have had significant effects on resilience in the workforce (Grant, Green, & Rynsaardt, 2010; Griffith & West, 2013; Sood et al., 2011; Vanhove et al., 2015), yet the effects of a wellbeing intervention on resilience were minimal in this present study. Therefore, it is conceivable that the measures or intervention used in this study were insufficient for identifying or achieving significant results. With regards to the organisational resilience measure in particular, there were a number of participants who responded using the ‘don’t know’ option, or provided no response (up to 16.5%). Indeed, in comparison to all other scales in the survey, the ResOrg measure (Lee et al., 2013) had the most missing responses. In the initial scale development, whilst non-executive employees were encouraged to participate, it is unknown whether this scale was predominantly completed by executives of the participating organisations. Indeed, qualitative comments from participants in this present study indicate that some of the items may have been difficult to answer for a non-executive employee. For example, answering items such as ‘Given how others depend on us, the way we plan for the unexpected is appropriate’ and ‘We are known for our ability to use knowledge in novel ways’ requires respondents to have access to specifics of the organisation’s strategic planning. Common themes from the participants’ feedback on this matter are the comments “*Ours is a large organisation. It is difficult to give answers to such broad questions about the organization*” and “*Perhaps a manager would be in a better position to answer these questions*”. Whilst it may be convenient at this point to suggest future research uses more established measure of organisational resilience, in reality alternative validated measures of organisational resilience are scant. As such, these findings suggest the need for future research development of

measures of organisational resilience, or alternatively, for the measure to be answered only by executive employees.

Furthermore, with regards to the intervention used in this study, whilst the Game met up to its developers' expectations by increasing general wellbeing, given the lack of change in perceived organisational support and the work-related wellbeing variables, it is conceivable that the Game itself has limited influence in the workplace.

Alternatively, whilst a practical solution to building resilience was sought, higher participation rates, commitment to the Game, and potentially higher effects on the resilience, attitudinal and wellbeing variables may have been achieved if supervisors or representatives of the organisation had greater involvement in the intervention (Nielsen, 2013). In this study, the majority of communications with participants was via email from the researchers. Senior managers are seen by employees to have the ability to allocate intervention resources and can act as intervention role models (Schaufeli et al., 2013). Whilst there were no differences in work engagement levels between the control and experiment groups, as participants self-selected to participate in the surveys and intervention, it may be that those who would have benefited most from the intervention did not participate due to time restrictions or personal reasons. For future research, ensuring supervisors promote the Game, provide the time for employees to participate in intervention training and activities (Nielsen & Abildgaard, 2013), and workplaces are conducive to the use of such interventions, may result in increased employee wellbeing and improved organisational performance (Cascio, 1991). Building on this recommendation, as organisations are understandably interested in return on investment, to provide empirical evidence for the link between employee resilience and organisational outcomes, future studies should incorporate supervisor's rating of employees' resilient behaviours demonstrated on the job (Nielsen & Abildgaard, 2013). Further, as participants may have seen the provision of the Game as an indication of their supervisor's (not

organisation's) support, a measure of perceived supervisor support should be used in future studies to assess whether the provision of the Game is an enabler of resilience.

Other potential reasons for not finding statistically significant effects of the Game on organisational and trait resilience, and the attitudinal and wellbeing variables (other than general wellbeing), relate to potential study flaws. First, the limited sample size may have undermined the statistical power to detect an effect might there be one (Field, 2013). Future studies should aim for a minimum of 150 intervention group participants (Hinkin, 1995). Second, consistent with the literature on wellbeing interventions for non-clinical samples, pre-intervention ceiling effects were evident (particularly for employee resilience, $M = 4.15$, $SD = .46$, on a scale from 1–5), potentially reducing the reliability and generalisability of results (Field, 2013). Notwithstanding, the fact that only two organisations participated in this present study is likely to have the greatest impact on the ability to generalise results. To address this deficit, subsequent data has been collected, and will continue to be collected, from additional organisations for future analysis.

Attrition rates are notoriously high in wellbeing interventions (Meyers et al., 2013; Vanhove et al., 2015). Research suggests that if a group of employees have a joint understanding that the intervention may be of benefit to them they will as a unit work towards the success of the intervention (Nytrø, Saksvik, Mikkelsen, Bohle, & Quinlan, 2000). As such, to secure participation, a thorough briefing was provided to all invited participants, prior and throughout the study. Additionally, guided by the literature and best practice guidelines on workplace interventions (Anseel, Lievens, Schollaert, & Choragwicka, 2010; Nielsen, 2013; Nielsen & Abildgaard, 2013), participation in the Game was incentivised to gain and sustain participation. However, there were multiple comments in the qualitative feedback received on the Game that some Game participants found the competitive nature of their teammates counter to the benefits of wellbeing and team cohesion, and questioned using

a competition (regardless of incentives provided) to promote wellbeing. This may in turn have impacted on how some participants responded to the Time 2 questions. This highlights the trade-offs between securing a sufficient study sample and intervention findings.

Another reason that a stronger effect of the Game on the resilience and attitudinal variables was not found is the short timeline between pre and post-intervention measurement. In order to fully assess any effects of the intervention, it is important for future research to measure outcomes at least six and 12 months post intervention to evaluate long-term intervention effects (Nielsen & Abildgaard, 2013). Changes in practices may be detected at a relatively early stage, whereas other changes (wellbeing, resilience) may not be detected until much later (Grant & Wall, 2009). To fully understand the change brought about after a wellbeing intervention, researchers must also take into account the context of the intervention and concurrent events (Nielsen, Randall, Holten, & González, 2010). Researchers of one study hypothesised that a mindfulness intervention provided a protective factor to retained employees during massive staff layoffs (Aikens et al., 2014a), yet another noted decreased levels of employee wellbeing when a mindfulness intervention was held during salary negotiations (Brooker et al., 2013). The two organisations in this present study were not undergoing any significant organisational change. Future research may look at the effects the Game has on employee wellbeing and resilience following major organisational changes such as downsizing, restructuring and diversification.

Further, exerting high levels of effort in wellbeing activities, and continuing to practice wellbeing strategies past the conclusion of the intervention, is likely to result in greater improvements in wellbeing (Lyubomirsky, 2008). Thus, for the benefit of the employee and the organisation, facilitators of wellbeing interventions should encourage employees to incorporate the activities into their daily lives until they become a habit (Sin & Lyubomirsky, 2009).

Conclusion

This study has provided a valuable contribution to the resilience literature by taking the first steps in filling in the gaps on how trait, employee and organisational-level resilience relate. The findings of this study add to the literature by investigating resilience specifically in the workplace and providing evidence for the contextual nature of resilience. Multiple factors influence organisational resilience (Lengnick-Hall et al., 2011) and building employees' resilience is one strategy an organisation may draw on to effectively respond to environmental changes to ensure the organisation's sustainability. Even interventions presenting small effect sizes can in theory have a major impact on populations' wellbeing when many people are reached (Huppert, 2009). Organisational leaders should create a culture which supports the wellbeing and resilience of their employees in order to build a collective capacity for organisational resilience; where employees adapt, bounce back, and thrive in the face of challenges.

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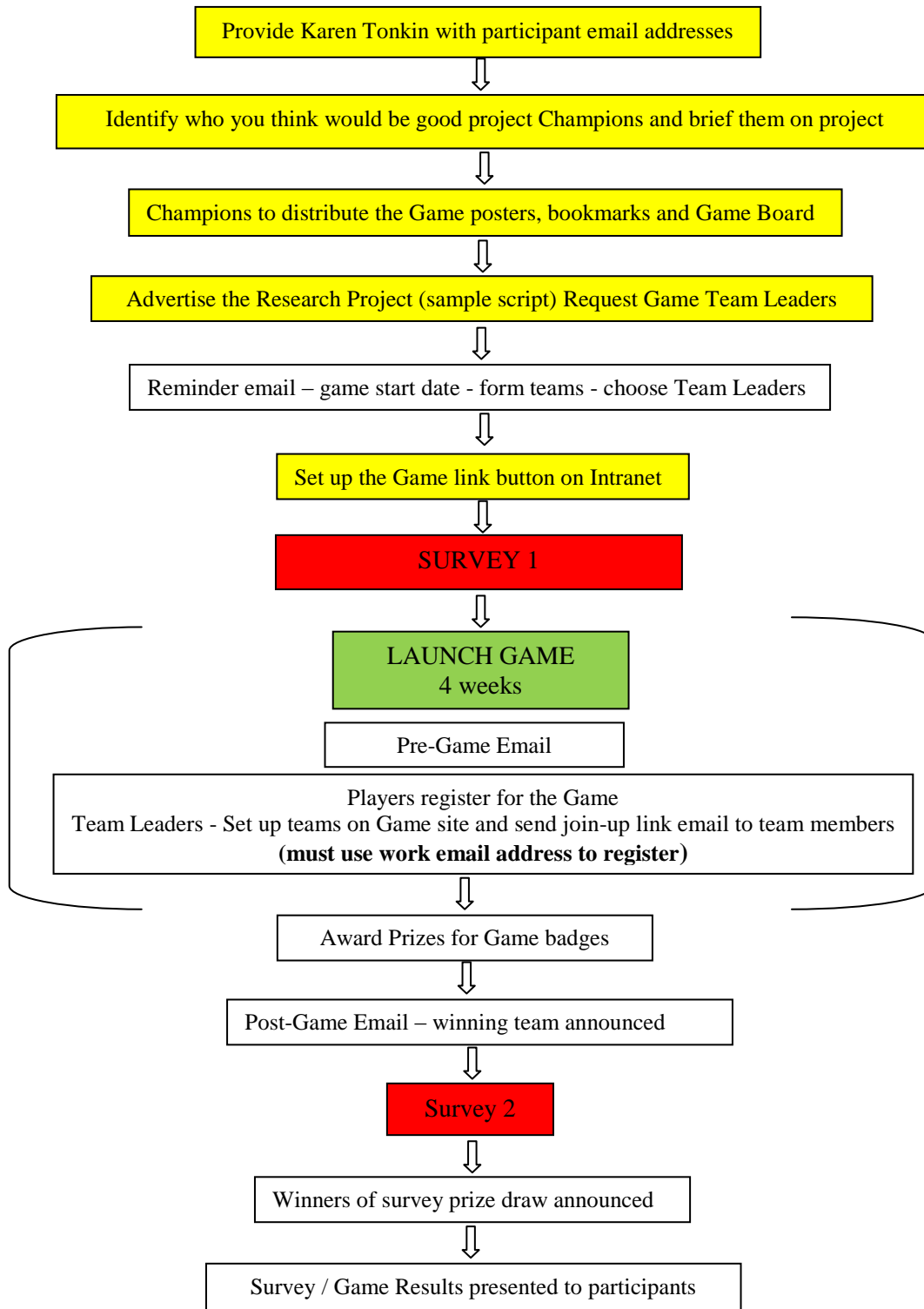
Appendices

Appendix A

A.1 — Organisation Flow Chart

UC EMPLOYEE RESILIENCE AND WELLBEING GAME FLOW CHART

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A.2 — Promoting Game Email

PROMOTING RESEARCH PROJECT TO EMPLOYEES

We have a new wellbeing initiative for our [organisation name] members for August.

[organisation name] members are invited to take part in a project on ‘wellbeing at work’ run by Karen Tonkin, a post-graduate Applied Psychology student.

The event has two components; a survey and a game (you can take part in the survey without participating in the game).

The Survey

This two-part University of Canterbury survey will enhance the researcher’s understanding of employee wellbeing and attitudes at work. By taking part in these two brief surveys you can enter a prize draw to **win one of 2 x \$100 Westfield Vouchers**.

The Game (24th August to 18th September)

[organisation name] are taking part in ‘**The Wellbeing Game**’. This fun game is based on The Five Ways to Wellbeing, ‘Give’ ‘Take Notice’ ‘Keep Learning’ ‘Be Active’ and ‘Connect’, which are scientifically shown to increase your wellbeing. ***The game runs for four weeks The winning team or individual get a Misceo voucher for \$100, and throughout the game players can win coffee vouchers.***

We know you are really busy, but if you take part in both the survey and the game it will be a huge help to the research and, more importantly, to your wellbeing. Plus, the more you participate, the more chances you get to win some great prizes!!

Check out the game here: <https://www.thewellbeinggame.org.nz/>

You can play as part of a team and compete against each other, or participate individually, by scoring points every time you record a wellbeing activity on the game website. For example “*I went for a walk at lunchtime with a colleague and learnt about her team’s latest project*” Be Active + Connect + Keep Learning = 45 minutes.

You can get points without having to do anything different to your usual day-to-day activities – the game gets you to think about things you are already doing which improve your wellbeing. Of course once you see how easy it is to do things that make you happy, hopefully you’ll start doing more of these (and get more points).

It takes less than one minute to record an activity.

Yes, you do have 3 minutes a week to record activities! Check out the attached FAQs.

Each team needs – a minimum of 3 players, a Team Name, and a Team Leader. We already have some Wellbeing Champions signed up [*insert names here*]. We are calling for people to take on the role of ‘Wellbeing Game’ Team Leader now!

We’ll be sending around The Wellbeing Game posters and bookmarks to remind you of the Five Ways to Wellbeing.

This is a chance to boost your wellbeing at work and help out with some cutting edge research.

A summary of the results of the research will be presented to you at our [organisation name] meeting in November.

A.3 — Online Questionnaire Content

Information and consent

WELLBEING SURVEY

Dear [organisation] members

You are invited to take part in research on employee wellbeing and attitudes, conducted by researchers from the University of Canterbury, in collaboration with the Mental Health Foundation. We appreciate how busy you must be, but we would really value your opinions! Part of this research is being conducted as part of Karen Tonkin's Master of Science (Applied Psychology) research project, so we would also appreciate your support in her conducting her research.

The survey will take about 10 minutes to complete. It asks your opinions about your workplace and your general attitudes towards your job. We have also included some questions on wellbeing. Please note that there are no right or wrong responses – we are simply interested in your opinions. **The survey is completely confidential, and you will not be identified as a participant.** In five weeks, we would like to send you a similar survey to ask whether things have changed at all. You do not need to commit to completing the second survey now.

The results of this research may be published in academic journals or conference proceedings. However, **the information you provide will not be linked back to you in any way.** We will provide you with a summary of our findings, but no [organisation] staff member will see your ratings. We would really love to hear from you!

As a thank you for completing the two Wellbeing surveys, you are given an opportunity to **take part in a prize draw to win one of two \$100 shopping vouchers.** *Please note: this relates only to the Wellbeing surveys sent out by the UC researchers*

We hope to have you on board! Please do not hesitate to contact us for further information.

Many thanks,

Dr Katharina Näswall (katharina.naswall@canterbury.ac.nz) Ph. 03 364 2552

Dr Joana Kuntz (joana.kuntz@canterbury.ac.nz) Ph. 03 364 2987 ext 3635

Dr Sanna Malinen (sanna.malinen@canterbury.ac.nz) Ph. 03 364 2987, ext 7006

Karen Tonkin (karen.tonkin@pg.canterbury.ac.nz)

This survey has been reviewed and approved by the University's Human Ethics Committee.

Participant Consent

Consent

☐ Yes, I consent to participating in this survey

Demographics (Time 1 survey only)

Here are a few questions about you.

What is your age (in years)?

What is your gender? (Male, Female, Other)

Scales

The following blocks of questions ask about your general opinions about your work. Please note that there are no right or wrong responses; we are simply interested in your opinions.

These questions ask you to consider how the **organisation** you work for deals with **challenges** and **change**.

Please note - we have included a 'Don't Know' option.

Organisational Resilience *(Scale headings were not included in Qualtrics participant survey)*

Response Scale: Five point likert scale with anchors being “strongly disagree” “disagree” “neither agree nor disagree” “agree” “strongly agree”, with an additional “don’t know” option.

1. Given how others depend on us, the way we plan for the unexpected is appropriate
2. Our organisation is committed to practicing and testing its emergency plans to ensure they are effective
3. We have a focus on being able to respond to the unexpected
4. We build relationships with others we might have to work with in a crisis
5. We have clearly defined priorities for what is important during and after a crisis
6. There are few barriers to stop us from working well with other organisations
7. Our organisation maintains sufficient resources to absorb some unexpected changes
8. People in our organisation are committed to working on a problem until it is resolved
9. If key people were unavailable, there are always others who could fill their role
10. There would be good leadership from within our organisation if we were struck by a crisis

11. We are known for our ability to use knowledge in novel ways
12. We can make tough decisions quickly
13. We proactively monitor our industry to have an early warning of emerging issues

Do you have any further comments with regards to the questions above?

These questions ask you about how **you** deal with challenges at work.

Employee Resilience

Response Scale: Five point likert scale with anchors being “strongly disagree” “disagree” “neither agree nor disagree” “agree” “strongly agree”.

1. I effectively collaborate with others to handle challenges at work
2. I successfully manage a high workload for long periods of time
3. I resolve crises competently at work
4. I re-evaluate my performance and continually improve the way I do my work
5. I effectively respond to feedback at work, even criticism
6. I seek assistance at work when I need specific resources
7. I approach managers when I need their support
8. I use change at work as an opportunity for growth
9. I learn from mistakes at work and improve the way I do my job

Do you have any further comments with regards to the questions above?

This set of questions asks about how you deal with challenges in your day to day life.

Trait Resilience

Response Scale: Five point likert scale with anchors being “strongly disagree” “disagree” “neither agree nor disagree” “agree” “strongly agree”.

1. I am able to adapt to change
2. I can deal with whatever comes
3. I can see the humorous side of things
4. Coping with stress strengthens me
5. I tend to bounce back after illness, injury, or other hardships
6. I can achieve my goals despite obstacles

7. I can stay focused and think clearly under pressure
8. I am not easily discouraged by failure
9. I think of myself as a strong person
10. I can handle unpleasant things

Do you have any further comments with regards to the questions above?

These questions refer to your attitudes about work.

Perceived Organisational Support

Response Scale: Seven point likert scale from 1 = “strongly disagree” to 7 = “strongly agree”

1. Help is available from the organisation when I have a problem
2. When I do my best job possible, the organisation notices
3. The organisation cares about my opinions

Organisational Commitment

Response Scale: Seven point likert scale from 1 = “strongly disagree” to 7 = “strongly agree”

1. I would be very happy to spend the rest of my career with this organisation
2. This organisation has a great deal of personal meaning for me
3. I feel a strong sense of belonging to my organisation

These are some more questions about your feelings towards your work.

Response Scale: Five point likert scale from 1 = “strongly disagree” to 5 = “strongly agree”.

Work Engagement

1. I am highly engaged in this job

Job Satisfaction

1. All in all, I am satisfied with my job

Turnover Intentions

1. I often think about leaving the organisation

Previously we asked you to consider how you felt about your organisation. Now we would like you to specifically think about how you feel about your **work team**.

Response Scale: Seven point likert scale from 1 = “strongly disagree” to 7 = “strongly agree”

Team Commitment

1. I would be very happy to spend the rest of my career with this team
2. This team has a great deal of personal meaning for me
3. I feel a strong sense of belonging to my team

These questions ask you about your wellbeing.

Self-Rated Health

Response Scale: Five-point likert scale from 1 = “bad” to 5 = “excellent”.

1. How would you rate your health at the present time?
2. How do you rate the quality of your sleep last night?
3. How do you rate your average ability to concentrate?

This question is about your energy levels at work.

Energy Levels

Response Scale: Five-point likert scale from 1 = “not energetic at all” to 5 = “very energetic”.

1. How energetic do you usually feel at work?

And a few more questions on your wellbeing.

Work Health

Response Scale: Five-point likert scale from 1 = “strongly disagree” to 5 = “strongly agree”.

1. I think I can continue to work as I do now and remain healthy in the long run
2. I believe that my work affects my health in a negative way
3. If I had another job my health would probably be better

Now we would like you to think about how you have performed at work.

Self-Rated Performance

Response Scale: Five-point likert scale with 1 = “much worse”, 2 = “worse”, 3 = “same”, 4 = “better”, 5 = “much better”.

1. How would you rate your own performance over the past **month** compared to your average performance?

Thank you for your participation!

Remember: Any participants who also complete the Wellbeing Follow-Up Survey in five weeks time will be invited to enter into a prize draw for one of two \$100 Westfield vouchers

For further information about this research, please contact Karen Tonkin (karen.tonkin@pg.canterbury.ac.nz) or Dr Sanna Malinen (sanna.malinen@canterbury.ac.nz).

The Wellbeing Game (Time 2 survey only)

(Response Scale: Yes or No)

1. I participated in The Wellbeing Game
2. I participated in The Wellbeing Game in a team comprised of members of my own work unit

A.4 — The Wellbeing Game (the Game) Player Board

What did you do ? [\[info\]](#)

Click on the time you took [\[info\]](#)

Click one or more of the 5 Ways to Wellbeing that your activity used [\[info\]](#)

10 minutes 30 minutes 60 minutes 90 minutes two hours three hours

CONNECT
TALK & LISTEN,
BE THERE,
FEEL CONNECTED

TAKE NOTICE
REMEMBER
THE SIMPLE
THINGS THAT
GIVE YOU JOY

KEEP LEARNING
EMBRACE NEW
EXPERIENCES,
SEE OPPORTUNITIES,
SURPRISE YOURSELF

Give
Your time,
your words,
your presence

BE ACTIVE
DO WHAT YOU CAN,
ENJOY WHAT YOU DO,
MOVE YOUR BODY

[\[info\]](#) [\[info\]](#) [\[info\]](#) [\[info\]](#) [\[info\]](#)

Play !

Appendix B – Factor Analyses Tables 1–11

Table 1

Factor Loadings and Communalities for the Items Measuring Employee Resilience

	Item	Factor 1	h ²
ER01	I effectively collaborate with others to handle challenges at work	.55	.30
ER02	I successfully manage a high workload for long periods of time	.52	.27
ER03	I resolve crises competently at work	.61	.37
ER04	I re-evaluate my performance and continually improve the way I do my work	.68	.47
ER05	I effectively respond to feedback at work, even criticism	.66	.43
ER06	I seek assistance at work when I need specific resources	.54	.29
ER07	I approach managers when I need their support	.51	.26
ER08	I use change at work as an opportunity for growth	.51	.26
ER09	I learn from my mistakes at work and improve the way I do my job	.66	.44
	Eigenvalue	3.10	
	Percent of the variance (after extraction)	34.46	

Note: Principle axis factor analysis, oblimin rotation.

Table 2

Factor Loadings and Communalities for the Items Measuring Organisational Resilience

	Item	Factor 1	Factor 2	h ²
OR01	Given how others depend on us, the way we plan for the unexpected is appropriate	-.17	-.88	.65
OR02	Our organisation is committed to practicing and testing its emergency plans to ensure they are effective	.07	-.59	.39
OR03	We have a focus on being able to respond to the unexpected	.05	-.82	.71
OR04	We build relationships with others we might have to work with in a crisis	.07	-.63	.45
OR05	We have clearly defined priorities for what is important during and after a crisis	.07	-.68	.51
OR07	Our organisation maintains sufficient resources to absorb some unexpected changes	.67	-.07	.50
OR08	People in our organisation are committed to working on a problem until it is resolved	.70	.02	.48
OR09	If key people were unavailable, there are always others who could fill their role	.56	.03	.30
OR10	There would be good leadership from within our organisation if we were struck by a crisis	.60	-.16	.48
OR11	We are known for our ability to use knowledge in novel ways	.56	-.10	.38
OR12	We can make tough decisions quickly	.83	.14	.59
OR13	We proactively monitor our industry to have an early warning of emerging issues	.38	-.38	.38
	Eigenvalue	4.50	1.32	
	Percent of the variance (after extraction)	38.00	10.96	
	Factor correlations	-.49		

Note: Principle axis factor analysis, oblimin rotation.

Table 3

Factor Loadings and Communalities for the Items Measuring Trait Resilience

Item	Factor 1	h ²
TR01 I am able to adapt to change	.61	.37
TR02 I can deal with whatever comes	.73	.54
TR04 Coping with stress strengthens me	.57	.33
TR05 I tend to bounce back after illness, injury, or other hardships	.62	.38
TR06 I can achieve my goals despite obstacles	.65	.42
TR07 I can stay focused and think clearly under pressure	.66	.44
TR08 I am not easily discouraged by failure	.68	.460
TR09 I think of myself as a strong person	.73	.54
TR10 I can handle unpleasant things	.70	.49
Eigenvalue	3.96	
Percent of the variance (after extraction)	44.01	

Note: Principle axis factor analysis, oblimin rotation.

Table 4

Factor Loadings and Communalities for the Items Measuring Perceived Organisational Support

	Item	Factor 1	h ²
PS01	Help is available from the organisation when I have a problem	.66	.43
PS02	When I do my best job possible, the organisation notices	.89	.79
PS03	The organisation cares about my opinions	.88	.78
	Eigenvalue	2.00	
	Percent of the variance (after extraction)	66.79	

Note: Principle axis factor analysis, oblimin rotation.

Table 5

Factor Loadings and Communalities for the Items Measuring Organisational Commitment

Item		Factor 1	h ²
OS01	I would be very happy to spend the rest of my career with this organisation	.74	.54
OS02	This organisation has a great deal of personal meaning for me	.86	.73
OS03	I feel a strong sense of belonging to my organisation	.97	.93
Eigenvalue		2.20	
Percent of the variance (after extraction)		73.40	

Note: Principle axis factor analysis, oblimin rotation.

Table 6

Factor Loadings and Communalities for the Items measuring Team Commitment

	Item	Factor 1	h ²
TS01	I would be very happy to spend the rest of my career with this team	.75	.56
TS02	This team has a great deal of personal meaning for me	.90	.83
TS03	I feel a strong sense of belonging to my team	.90	.81
	Eigenvalue	2.19	
	Percent of the variance (after extraction)	73.09	

Note: Principle axis factor analysis, oblimin rotation.

Table 7

Factor Loadings and Communalities for the Items Measuring Self-Rated Health

Item		Factor 1	h ²
SH01	How would you rate your health at the present time?	.67	.45
SH02	How do you rate the quality of your sleep last night?	.72	.53
SH03	How do you rate your average ability to concentrate?	.69	.43
Eigenvalue		1.41	
Percent of the variance (after extraction)		46.96	

Note: Principle axis factor analysis, oblimin rotation.

Table 8

Factor Loadings and Communalities for the Items Measuring Work-Related Health Attributions

	Item	Factor 1	h ²
WH01	I think I can continue to work as I do now and remain healthy in the long run	.66	.41
WH02	I believe that my work affects my health in a negative way	.85	.71
WH03	If I had another job my health would probably be better	.85	.72
	Eigenvalue	1.84	
	Percent of the variance (after extraction)	61.41	

Note: Principle axis factor analysis, oblimin rotation.

Table 9

Factor Loadings and Communalities for the Items Measuring Employee Resilience and Organisational Resilience

	Item	Factor 1	Factor 2	Factor 3	h ²
ER01	I effectively collaborate with others to handle challenges at work	-.01	.69	.07	.44
ER02	I successfully manage a high workload for long periods of time	-.03	.54	-.02	.29
ER03	I resolve crises competently at work	-.08	.63	-.03	.40
ER04	I re-evaluate my performance and continually improve the way I do my work	-.02	.64	-.12	.46
ER05	I effectively respond to feedback at work, even criticism	-.07	.74	.04	.52
ER06	I seek assistance at work when I need specific resources	.07	.53	-.01	.31
ER07	I approach managers when I need their support	.17	.47	.00	.28
ER08	I use change at work as an opportunity for growth	.10	.47	.01	.25
ER09	I learn from my mistakes at work and improve the way I do my job	.04	.61	-.05	.41
OR01	Given how others depend on us, the way we plan for the unexpected is appropriate	.86	.02	.15	.64
OR02	Our organisation is committed to practicing and testing its emergency plans to ensure they are effective	.57	.08	-.07	.39
OR03	We have a focus on being able to respond to the unexpected	.80	-.08	-.10	.71
OR04	We build relationships with others we might have to work with in a crisis	.64	-.02	-.08	.46
OR05	We have clearly defined priorities for what is important during and after a crisis	.68	.07	-.05	.52
OR07	Our organisation maintains sufficient resources to absorb some unexpected changes	.080	-.05	-.69	.51
OR08	People in our organisation are committed to working on a problem until it is resolved	-.03	.00	-.71	.48
OR09	If key people were unavailable, there are always others who could fill their role	-.03	-.06	-.59	.31
OR10	There would be good leadership from within our organisation if we were struck by a crisis	.18	.04	-.58	.48
OR11	We are known for our ability to use knowledge in novel ways	.09	.20	-.49	.40
OR12	We can make tough decisions quickly	-.14	.16	-.76	.60
OR13	We proactively monitor our industry to	.32	-.05	-.43	.39

have an early warning of emerging issues			
Eigenvalue	5.51	2.50	1.25
Percent of the variance (after extraction)	26.23	11.90	5.93
Factor correlations	F1/F2	F2/F3	F1/F3
	.21	-.34	-.47

Note: Principle axis factor analysis, oblimin rotation.

Table 10

Factor Loadings and Communalities for the Items Measuring Employee Resilience and Trait Resilience

	Item	Factor 1	Factor 2	h ²
TR01	I am able to adapt to change	.66	-.05	.40
TR02	I can deal with whatever comes	.71	.04	.54
TR04	Coping with stress strengthens me	.54	.05	.32
TR05	I tend to bounce back after illness, injury, or other hardships	.57	.07	.37
TR06	I can achieve my goals despite obstacles	.55	.14	.41
TR07	I can stay focused and think clearly under pressure	.59	.08	.40
TR08	I am not easily discouraged by failure	.71	-.07	.46
TR09	I think of myself as a strong person	.81	-.15	.55
TR10	I can handle unpleasant things	.67	.02	.46
ER01	I effectively collaborate with others to handle challenges at work	.00	.56	.32
ER02	I successfully manage a high workload for long periods of time	.04	.51	.28
ER03	I resolve crises competently at work	.01	.63	.40
ER04	I re-evaluate my performance and continually improve the way I do my work	.02	.65	.44
ER05	I effectively respond to feedback at work, even criticism	.02	.64	.42
ER06	I seek assistance at work when I need specific resources	-.12	.63	.33
ER07	I approach managers when I need their support	.06	.48	.27
ER08	I use change at work as an opportunity for growth	.42	.25	.35
ER09	I learn from my mistakes at work and improve the way I do my job	.17	.55	.43
Eigenvalue		5.77	1.37	
Percent of the variance (after extraction)		32.04	7.62	
Factor correlations		.55		

Note: Principle axis factor analysis, oblimin rotation.

Table 11

Factor Loadings and Communalities for the Items Measuring Trait Resilience and Organisational Resilience

	Item	Factor 1	Factor 2	Factor 3	h ²
TR01	I am able to adapt to change	-.15	.64	.08	.41
TR02	I can deal with whatever comes	-.09	.75	.04	.56
TR04	Coping with stress strengthens me	.14	.51	.079	.35
TR05	I tend to bounce back after illness, injury, or other hardships	.19	.62	-.06	.45
TR06	I can achieve my goals despite obstacles	.13	.57	-.00	.37
TR07	I can stay focused and think clearly under pressure	-.10	.68	.047	.45
TR08	I am not easily discouraged by failure	.01	.72	-.08	.50
TR09	I think of myself as a strong person	.02	.78	-.03	.61
TR10	I can handle unpleasant things	.04	.68	.03	.48
OR01	Given how others depend on us, the way we plan for the unexpected is appropriate	.85	.08	-.15	.66
OR02	Our organisation is committed to practicing and testing its emergency plans to ensure they are effective	.57	.06	.08	.40
OR03	We have a focus on being able to respond to the unexpected	.79	.06	.08	.71
OR04	We build relationships with others we might have to work with in a crisis	.62	-.05	.13	.45
OR05	We have clearly defined priorities for what is important during and after a crisis	.66	-.01	.11	.51
OR07	Our organisation maintains sufficient resources to absorb some unexpected changes	.08	-.07	.70	.51
OR08	People in our organisation are committed to working on a problem until it is resolved	.03	-.06	.64	.43
OR09	If key people were unavailable, there are always others who could fill their role	-.07	.11	.54	.30
OR10	There would be good leadership from within our organisation if we were struck by a crisis	.11	.12	.60	.50
OR11	We are known for our ability to use knowledge in novel ways	.15	.01	.51	.40
OR12	We can make tough decisions quickly	-.11	-.01	.79	.56
OR13	We proactively monitor our industry to have an early warning of emerging issues	.33	-.08	.42	.39
Eigenvalue		5.79	2.86	1.28	
Percent of the variance (after extraction)		27.57	13.63	6.10	
Factor correlations		F1/F2 .23	F2/F3 .27	F1/F3 .46	

Note: Principle axis factor analysis, oblimin rotation.

Appendix C

Table 12

Organisation A (below diagonal) Organisation B (above diagonal) Time 1 Correlations, Means, Standard Deviations and Reliability Estimates (Cronbach's Alpha) for all the Resilience Variables in the Study

	Variable	M	SD	Alpha	1	2	3	4	M	SD	Alpha
1	EmpRes	4.25	.44	.82	1	.56**	.30**	.19	4.03	.46	.80
2	Trait Res	3.97	.51	.86	.52**	1	.03**	.09	3.85	.52	.86
3	OrgRes AC	3.64	.62	.82	.14	.13	1	.55**	3.75	.62	.81
4	OrgRes P	3.98	.51	.82	.15	.26**	.43**	1	4.07	.60	.86

Note: N=201; * $p < .05$, ** $p < .01$; EmpRes = Employee Resilience; TraitRes = Trait Resilience; OrgRes AC = Organisational Resilience (adaptive capacity); OrgRes P = Organisational Resilience (planning).

Appendix D

Table 13

Pre and Post-intervention Means and SDs for the Resilience, Wellbeing and Attitudinal variables.

Variable		Time 1				Time 2			
		Experimental Group		Control		Experimental Group		Control	
		Range	M	SD	M	SD	M	SD	M
Employee Resilience	1-5	4.15	.42	4.20	.46	4.18	.47	4.13	.51
Organisational Resilience AC	1-5	3.78	.64	3.78	.59	3.77	.65	3.89	.63
Organisation Resilience P	1-5	4.03	.60	4.14	.58	4.10	.58	4.22	.58
Trait Resilience	1-5	3.88	.56	3.95	.53	4.04	.51	4.02	.50
Perceived Organisational Support	1-7	4.83	1.36	4.78	1.14	4.84	1.40	4.87	1.15
Job Satisfaction	1-5	3.86	.97	3.94	.99	4.01	.96	3.88	1.07
Work Engagement	1-5	4.06	.86	4.02	1.00	4.02	.89	3.96	1.03
Organisational Commitment	1-7	4.90	1.47	4.82	1.40	4.92	1.45	4.85	1.43
Team Commitment	1-7	4.92	1.41	4.92	1.37	4.98	1.43	5.00	1.63
Turnover Intentions	1-5	2.36	1.12	2.21	1.07	2.47	1.18	2.46	1.26
Self-Rated Health	1-5	3.71	.68	3.80	.66	3.80	.72	3.66	.75
Work-Related Health	1-5	3.40	.88	3.53	.81	3.59	.85	3.60	.95
Energy Levels	1-5	3.57	.84	3.62	.89	3.79	.77	3.71	.92
Self-Rated Performance	1-5	3.27	.71	3.25	.66	3.41	.77	3.25	.60

Note: AC -= Adaptive Capacity, P = Planning